

FIG. 1A

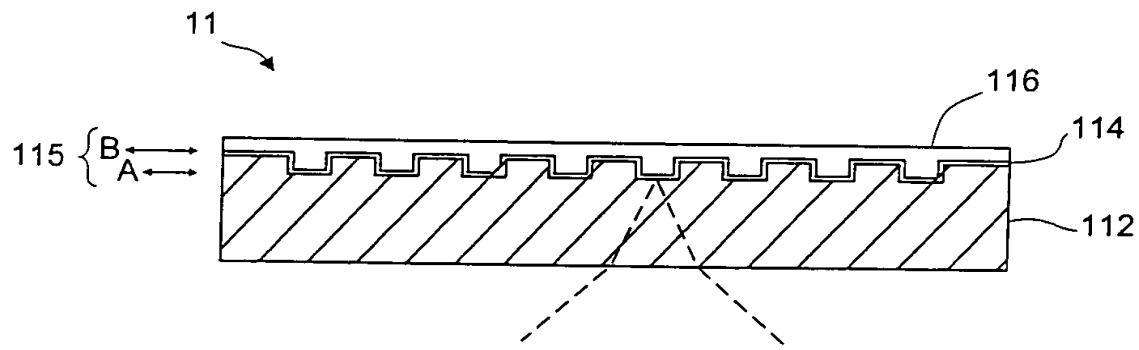


FIG. 1B

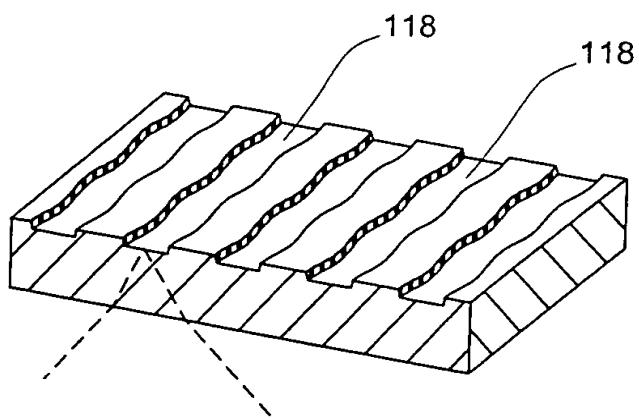


FIG. 1C

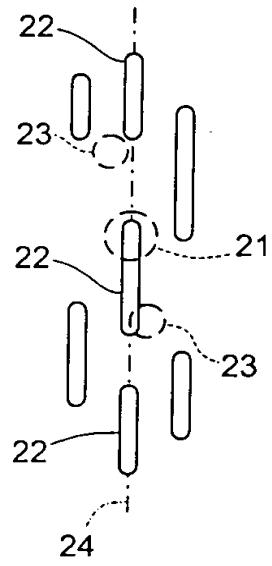


FIG. 2A

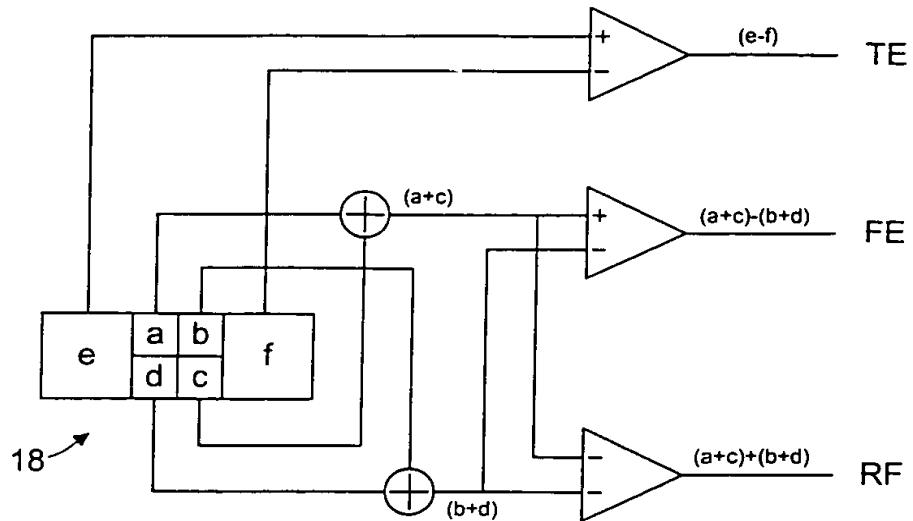


FIG. 2B

FIG. 3A

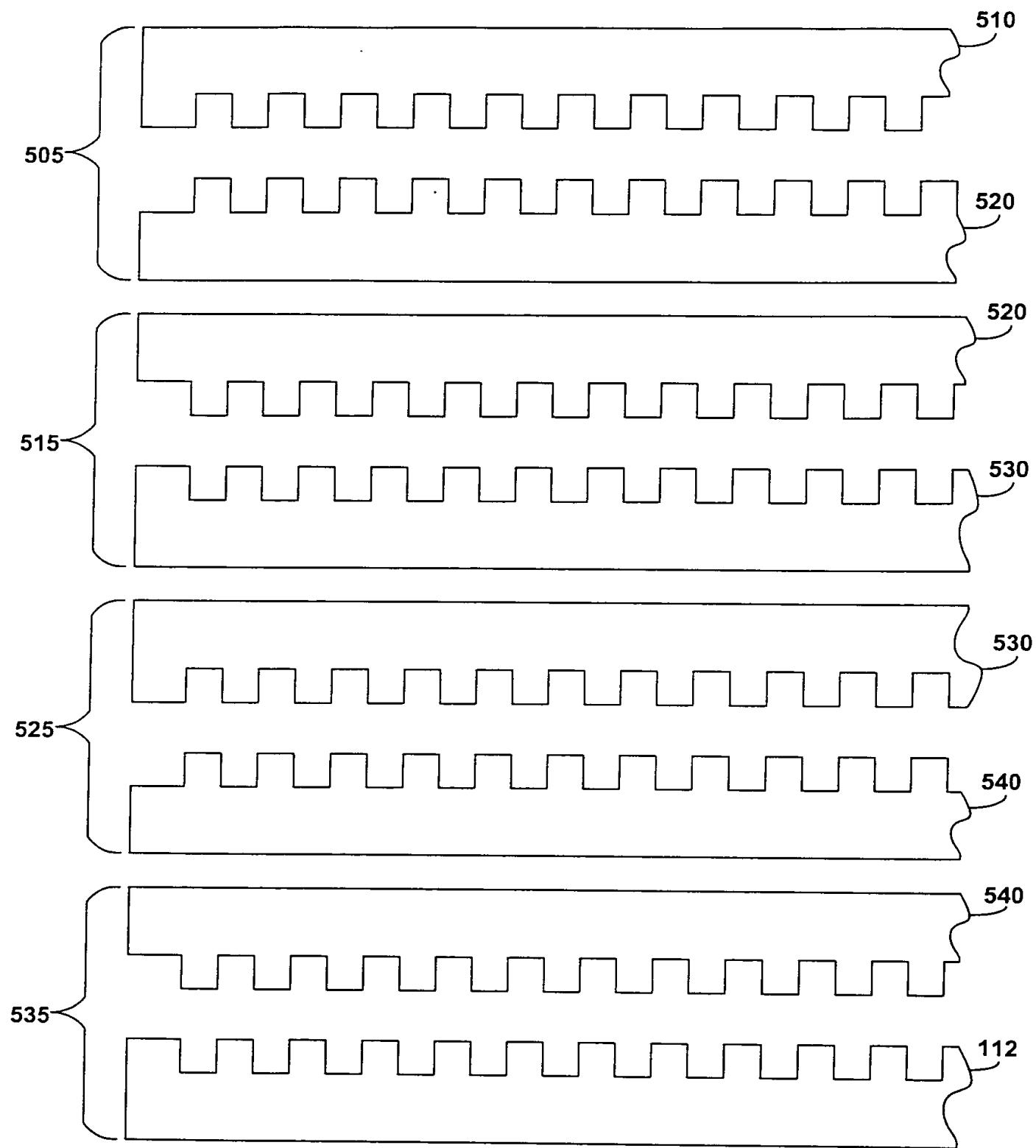


FIG. 3B

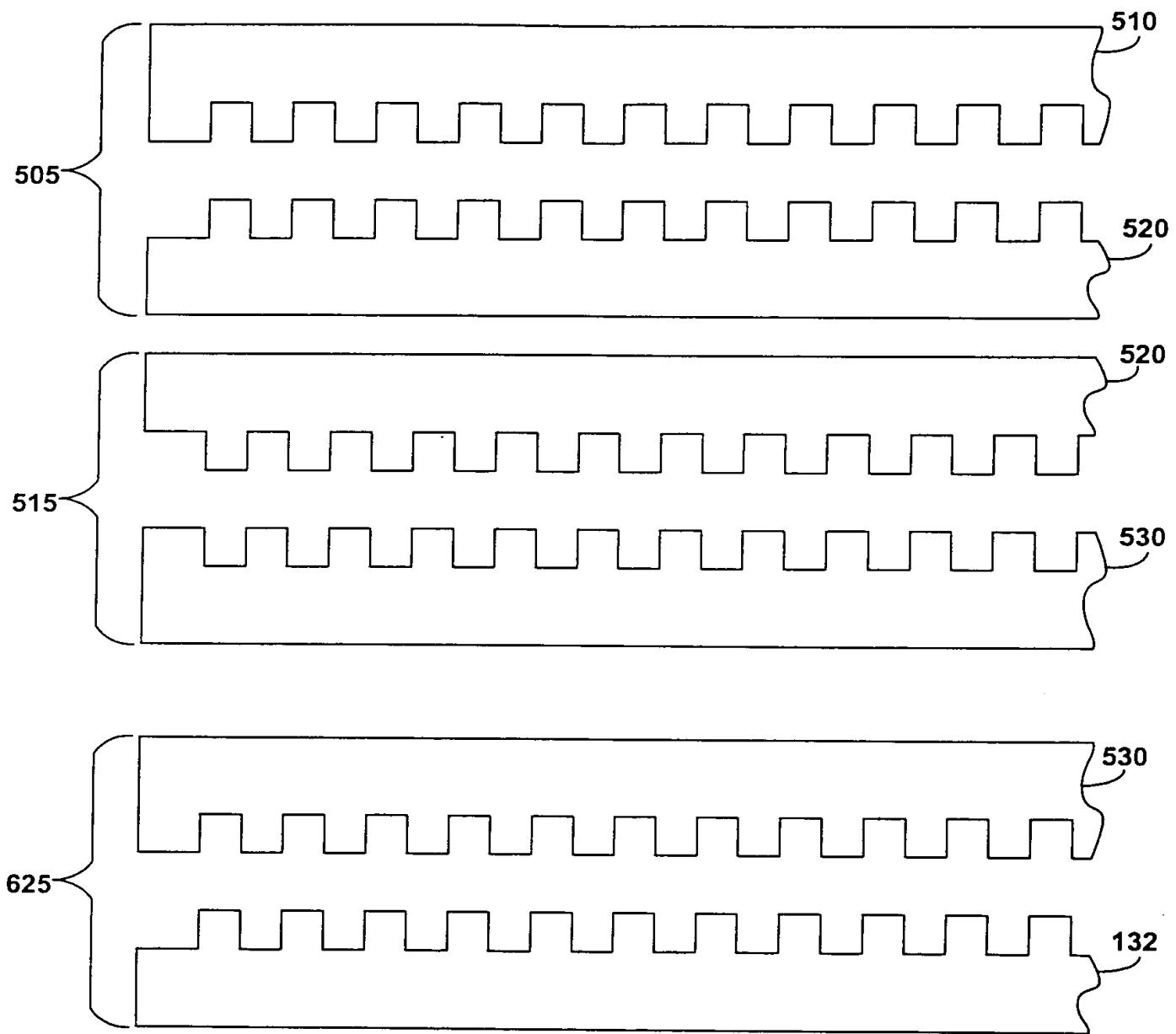


FIG. 3C

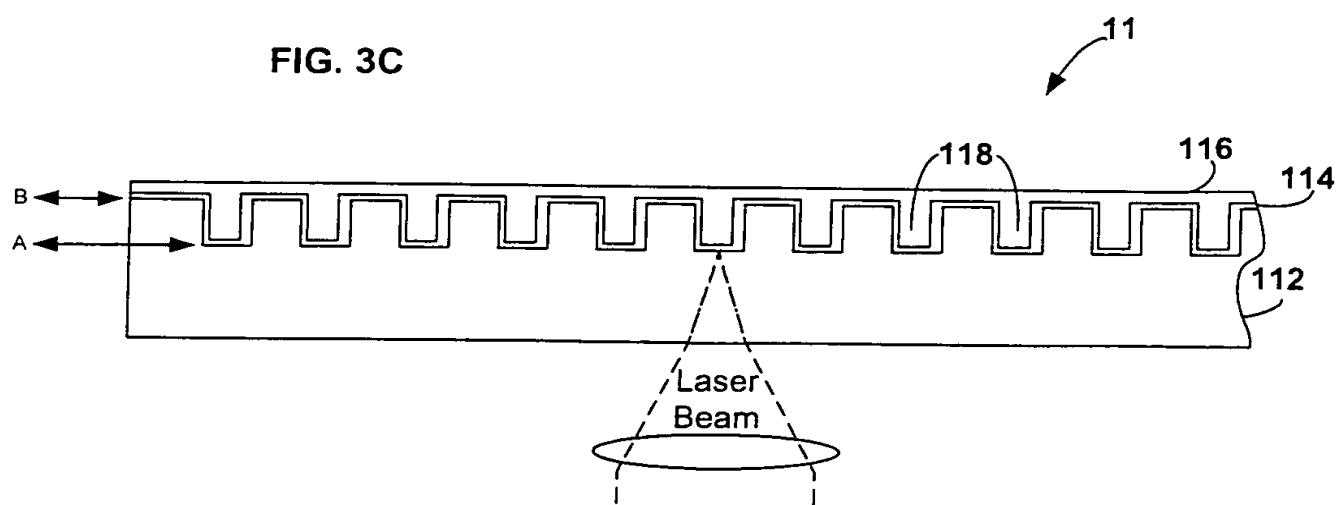


FIG. 3D

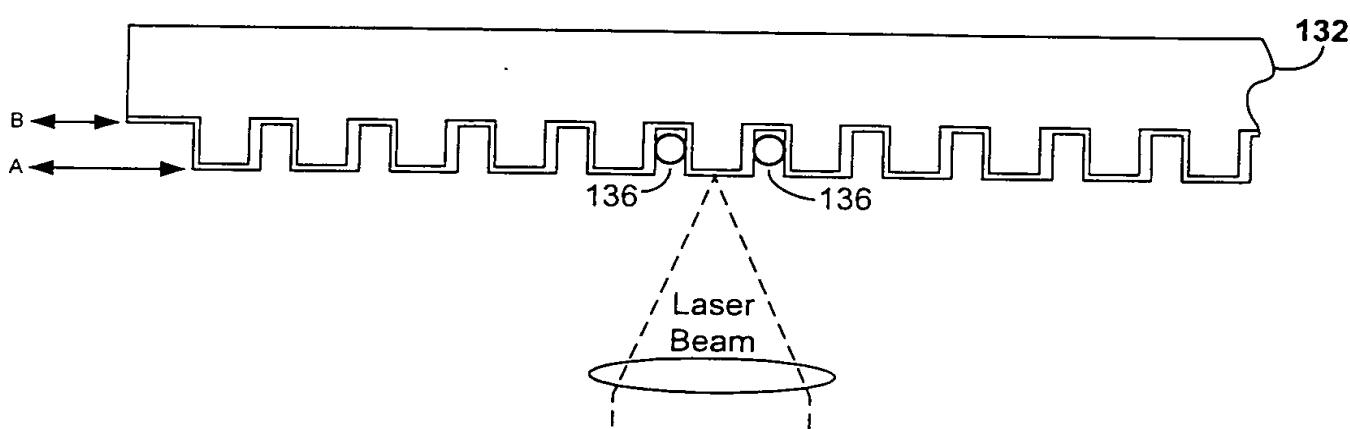
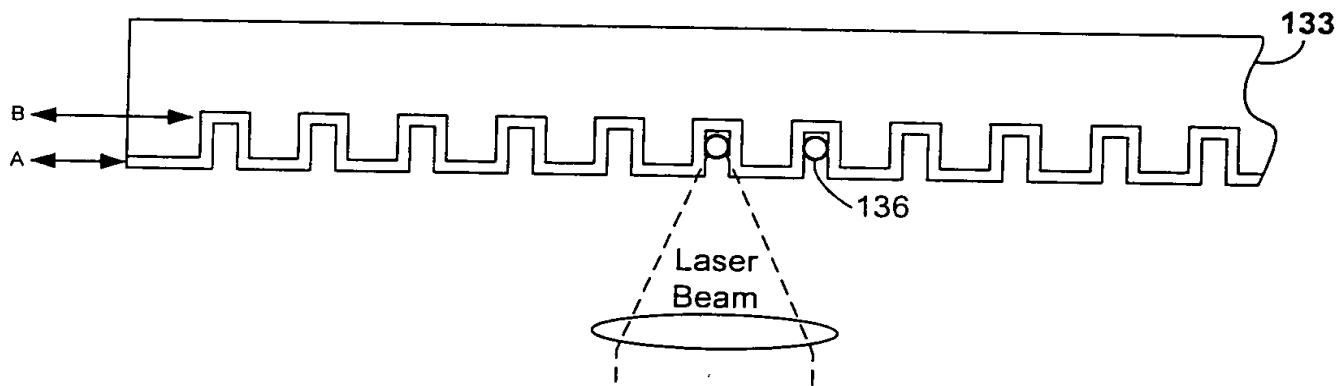
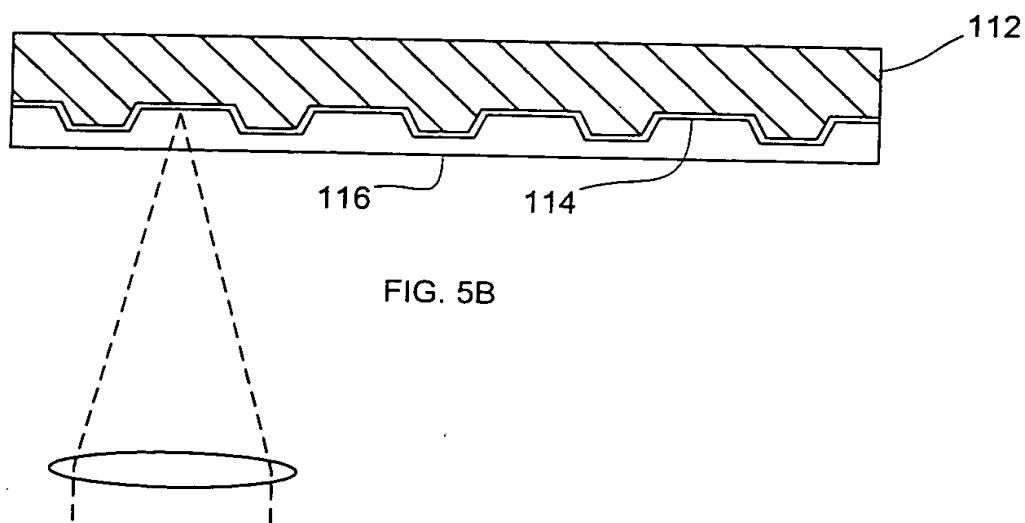
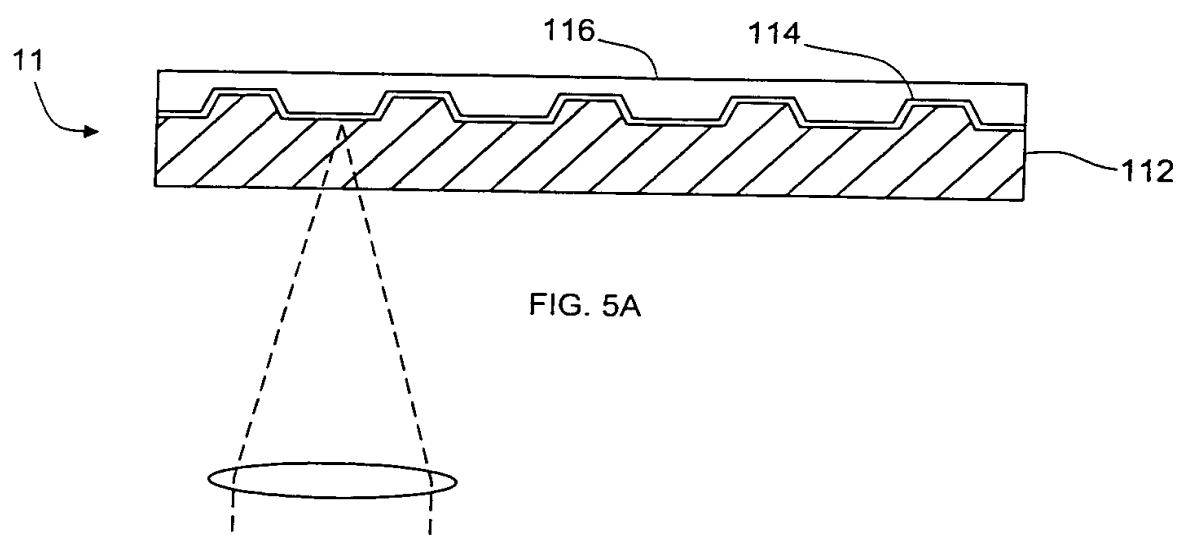
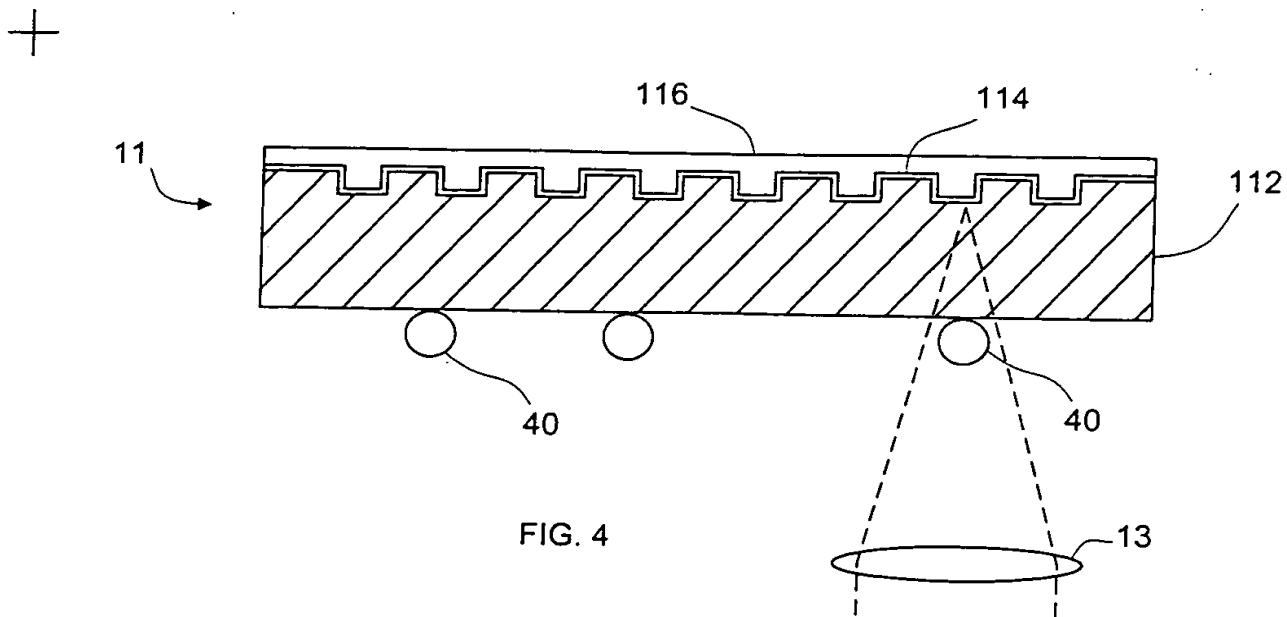


FIG. 3E





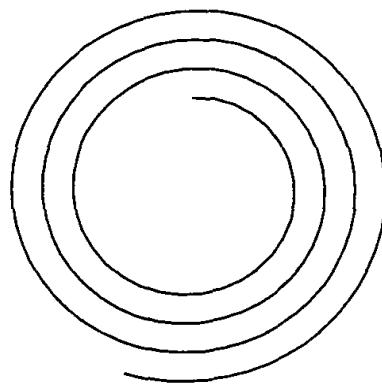


FIG. 5C

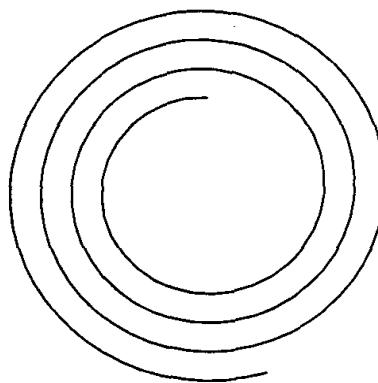


FIG. 5D

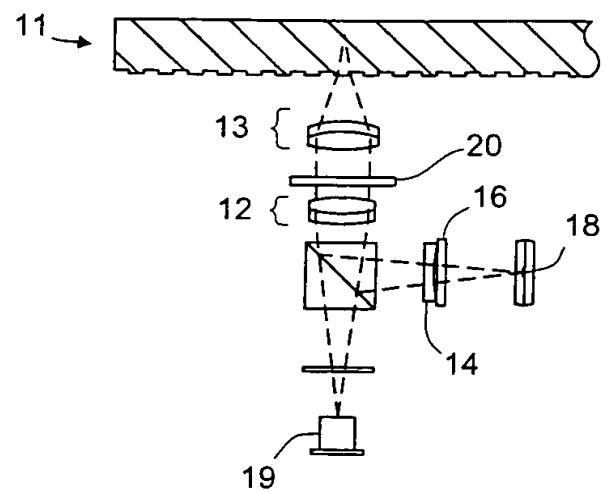


FIG. 6A

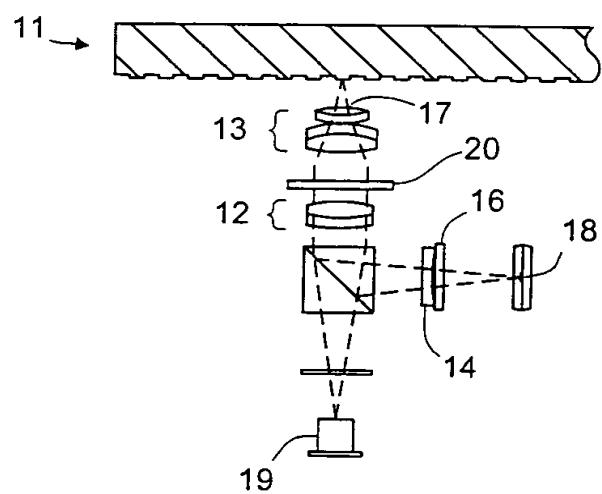


FIG. 6B

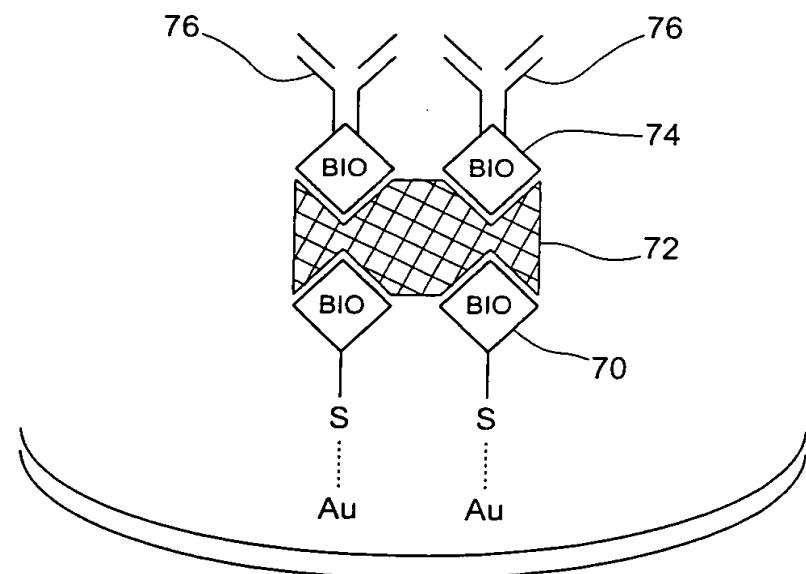


FIG. 7A

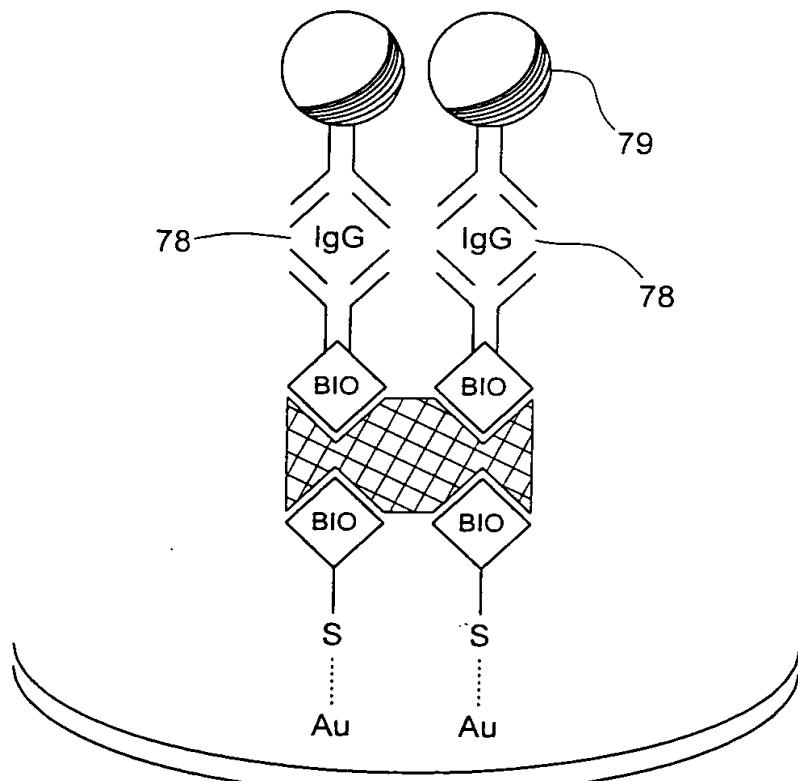
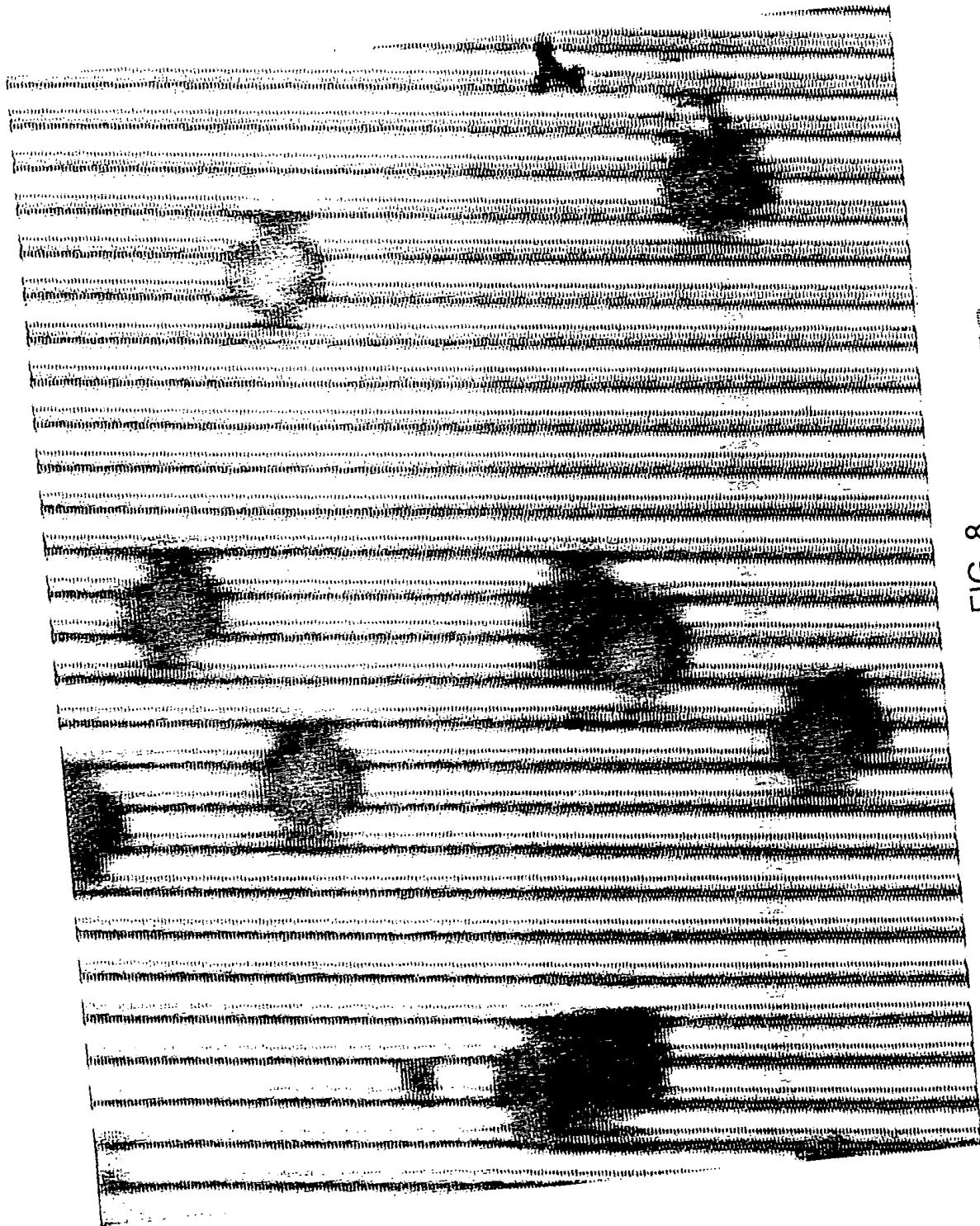


FIG. 7B

FIG. 8
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z



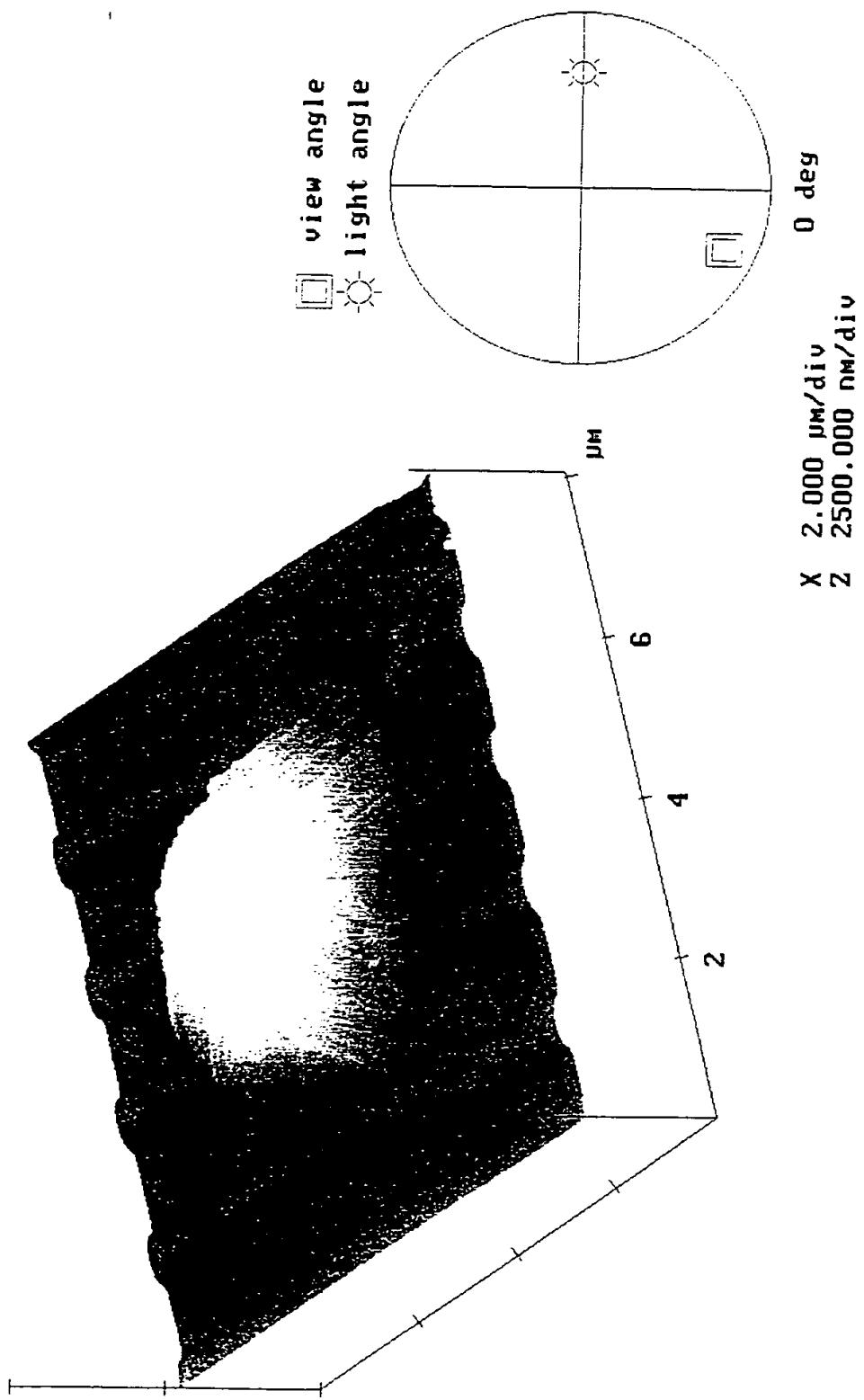
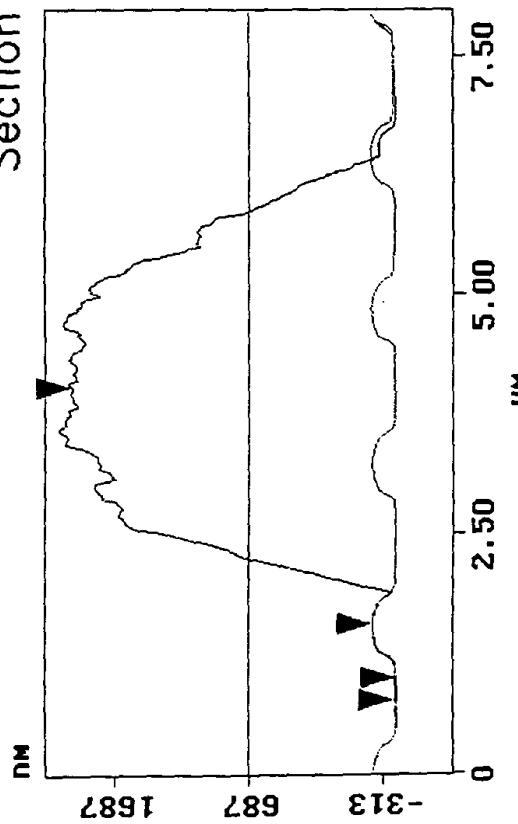


FIG. 9

Figure 9 shows a 3D surface plot of a biological specimen, likely a cell, with a circular inset diagram illustrating the view and light angles.

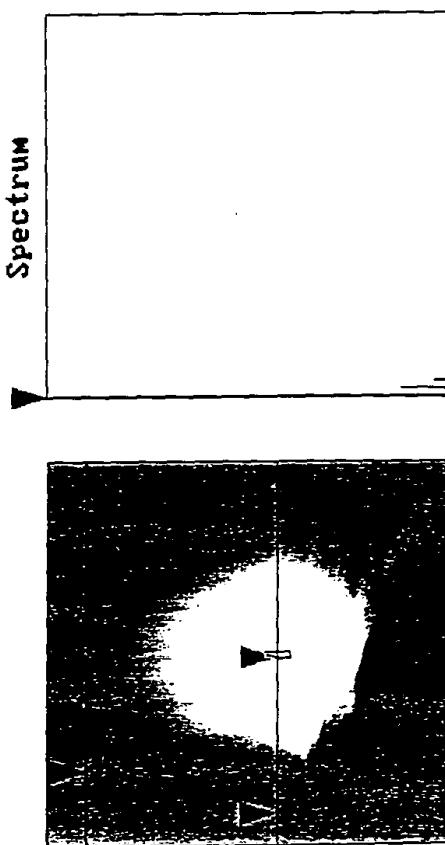
Cursor Marker Spectrum Zoom Center Line Offset Clear

Section Analysis



L	562.50 nm
RMS	72.881 nm
Ic	DC
Ra(1c)	21.437 nm
RMax	79.940 nm
Rz	66.462 nm
Rz Cnt	4
Radius	301.86 nm
Sigma	40.332 nm

Surface distance	631.28 nm
Horiz distance(L)	562.50 nm
Vert distance	171.70 nm
Angle	16.975 deg
Surface distance	5.531 μm
Horiz distance	3.266 μm
Vert distance	2.407 μm
Angle	36.388 deg
Surface distance	
Horiz distance	
Vert distance	
Angle	
Spectral period	DC
Spectral freq	0 Hz
Spectral RMS amp	469.97 nm



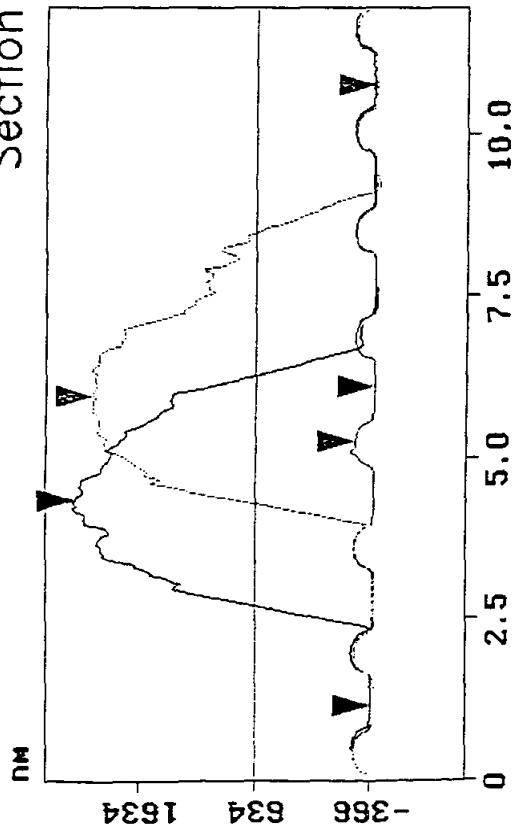
Sphere on Wobble Groove
grating.013
Cursor: fixed 2 Zoom: 2:1
Cen Line: off Offset: On

Min

FIG. 10

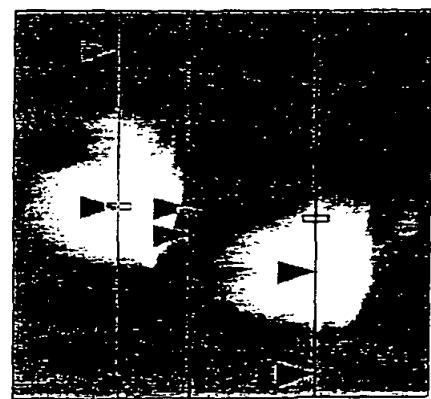
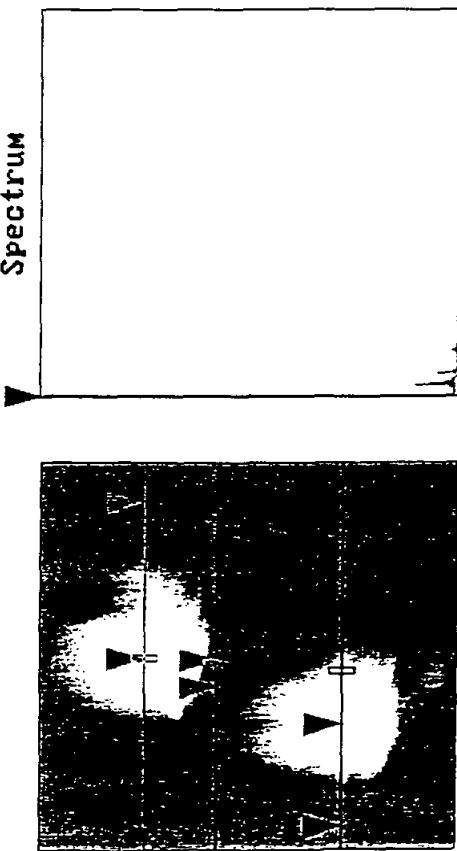
Cursor Marker Spectrum Zoom Center Line Offset Clear

Section Analysis



L	843.75 nm
RMS	63.849 nm
Ic	DC
Ra(Ic)	27.782 nm
RMax	97.447 nm
Rz	96.754 nm
Rz Cnt	2
Radius	450.61 nm
Sigma	62.095 nm

Surface distance	6.867 μm
Horiz distance(L)	4.828 μm
Vert distance	2.445 μm
Angle	26.858 deg
Surface distance	894.27 nm
Horiz distance	843.75 nm
Vert distance	169.96 nm
Angle	11.389 deg
Surface distance	5.302 μm
Horiz distance	3.211 μm
Vert distance	2.568 μm
Angle	38.649 deg
Spectral period	DC
Spectral freq	0 Hz
Spectral RMS amp	461.26 nm



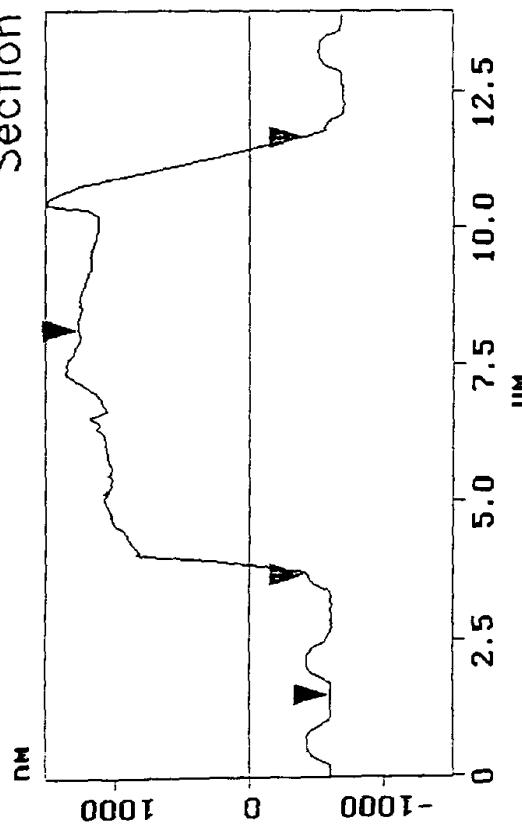
Sphere on Hobble Groove
grating.014

Cursor: fixed 3 Zoom: 2:1 Cen line: off offset: on

FIG. 11
Surface profile of a sphere on a hobbie groove grating.

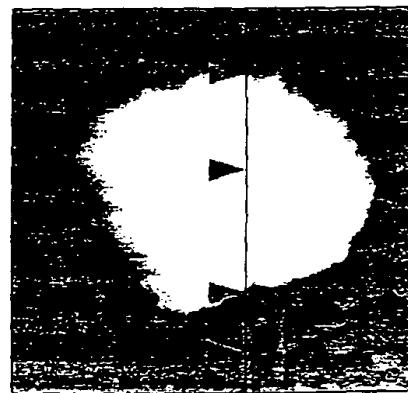
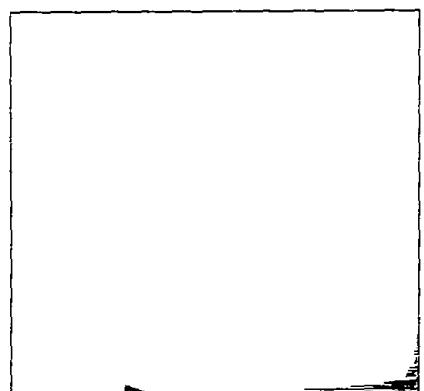
Cursor Marker Spectrum Zoom Center Line Offset Clear

Section Analysis



L	6.672 μ m
RMS	782.05 nm
IC	DC
Ra(ClC)	284.31 nm
RMax	1.187 μ m
RZ	868.11 nm
RZ Cnt	4
Radius	3.512 μ m
Sigma	426.35 nm

Surface distance	10.707 μ m
Horiz distance(L)	7.984 μ m
Vert distance	11.549 nm
Angle	0.083 deg
Surface distance	8.179 μ m
Horiz distance	6.672 μ m
Vert distance	1.860 μ m
Angle	15.575 deg
Surface distance	
Horiz distance	
Vert distance	
Angle	
Spectral period	DC
Spectral freq	0 Hz
Spectral RMS amp	493.32 nm



Cells on Hobble Groove
grating.016
Cursor: fixed Zoom: 2:1 Cen line: off offset: off

FIG. 12

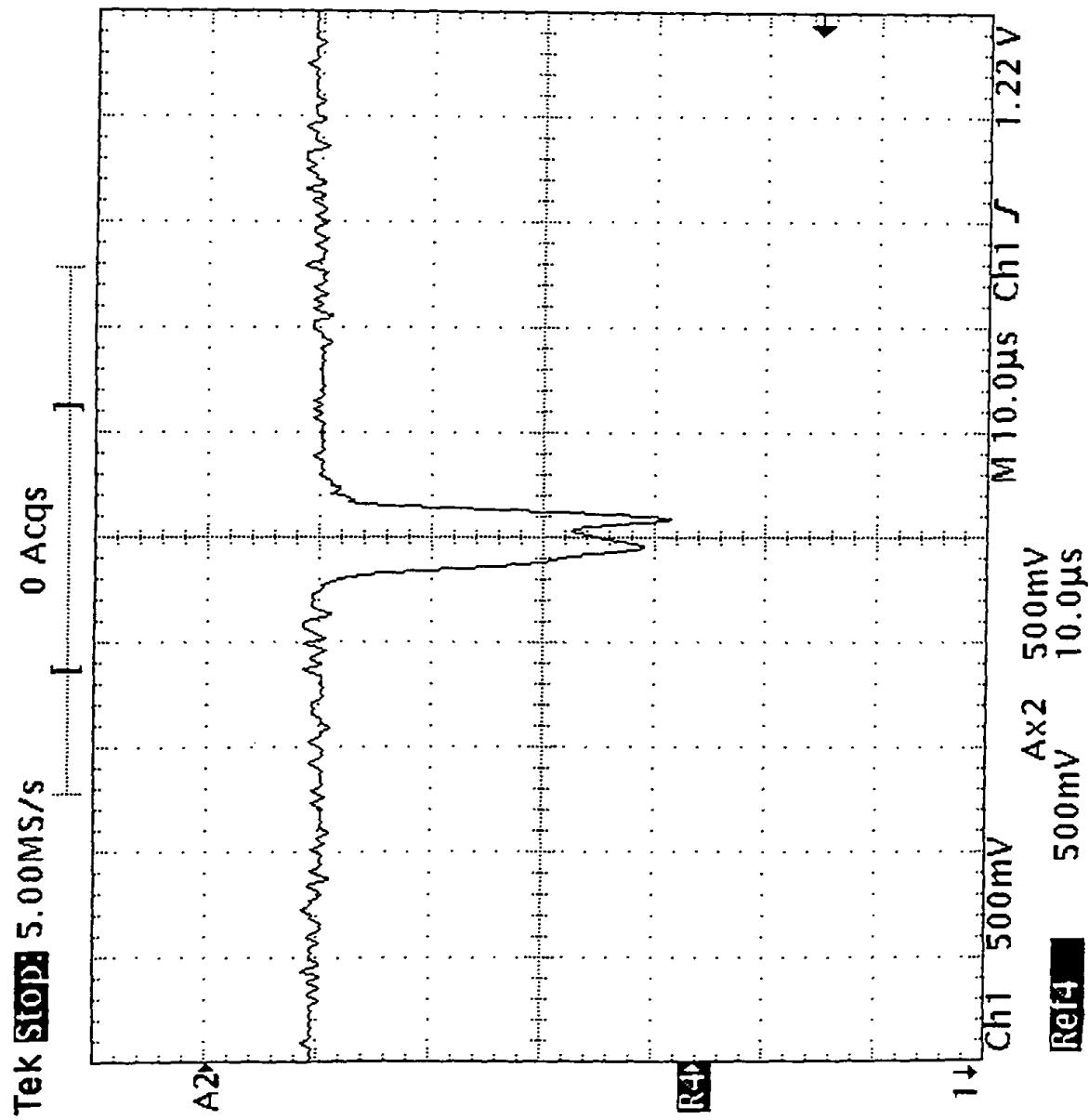


FIG. 13

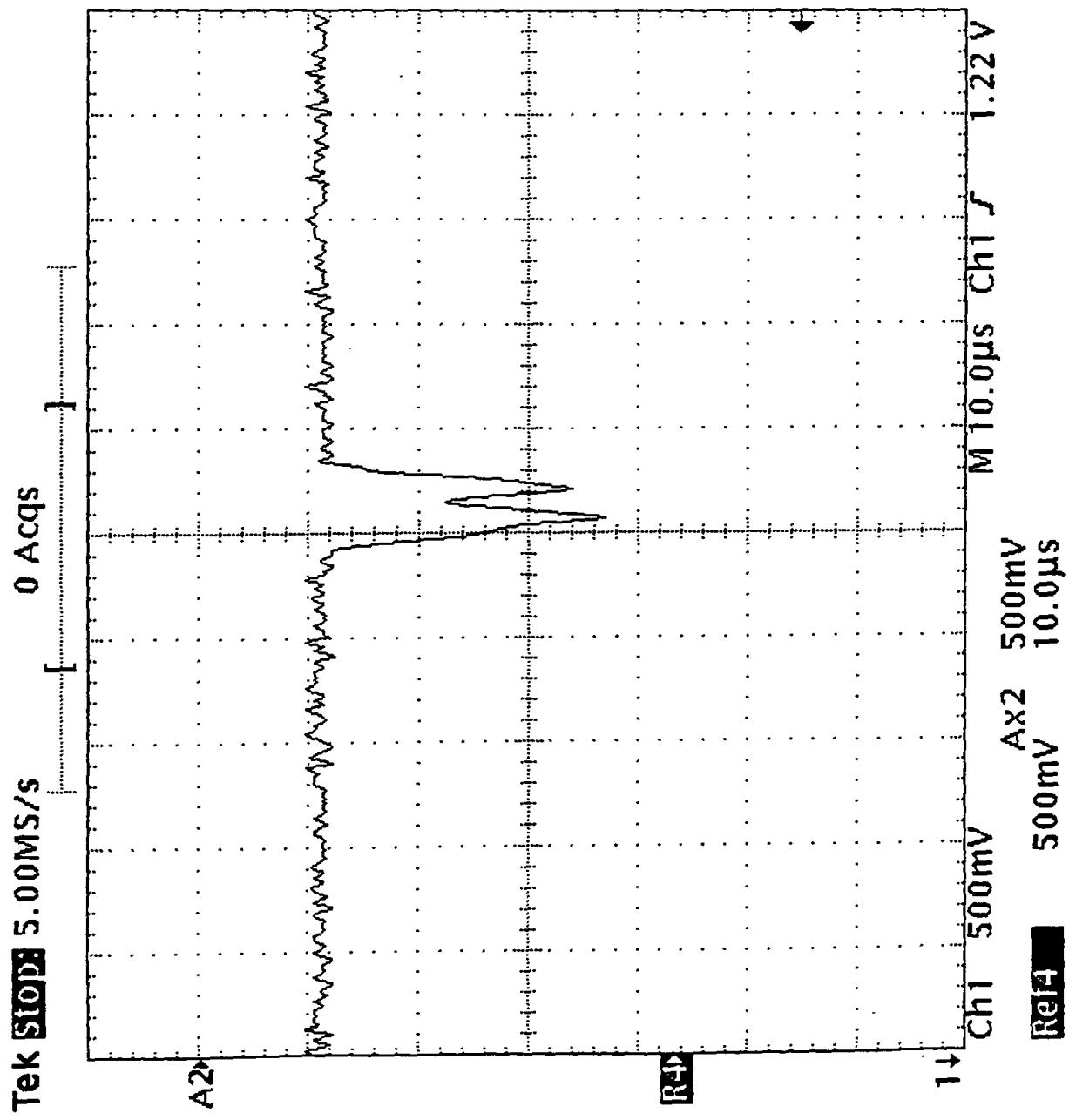


FIG. 14

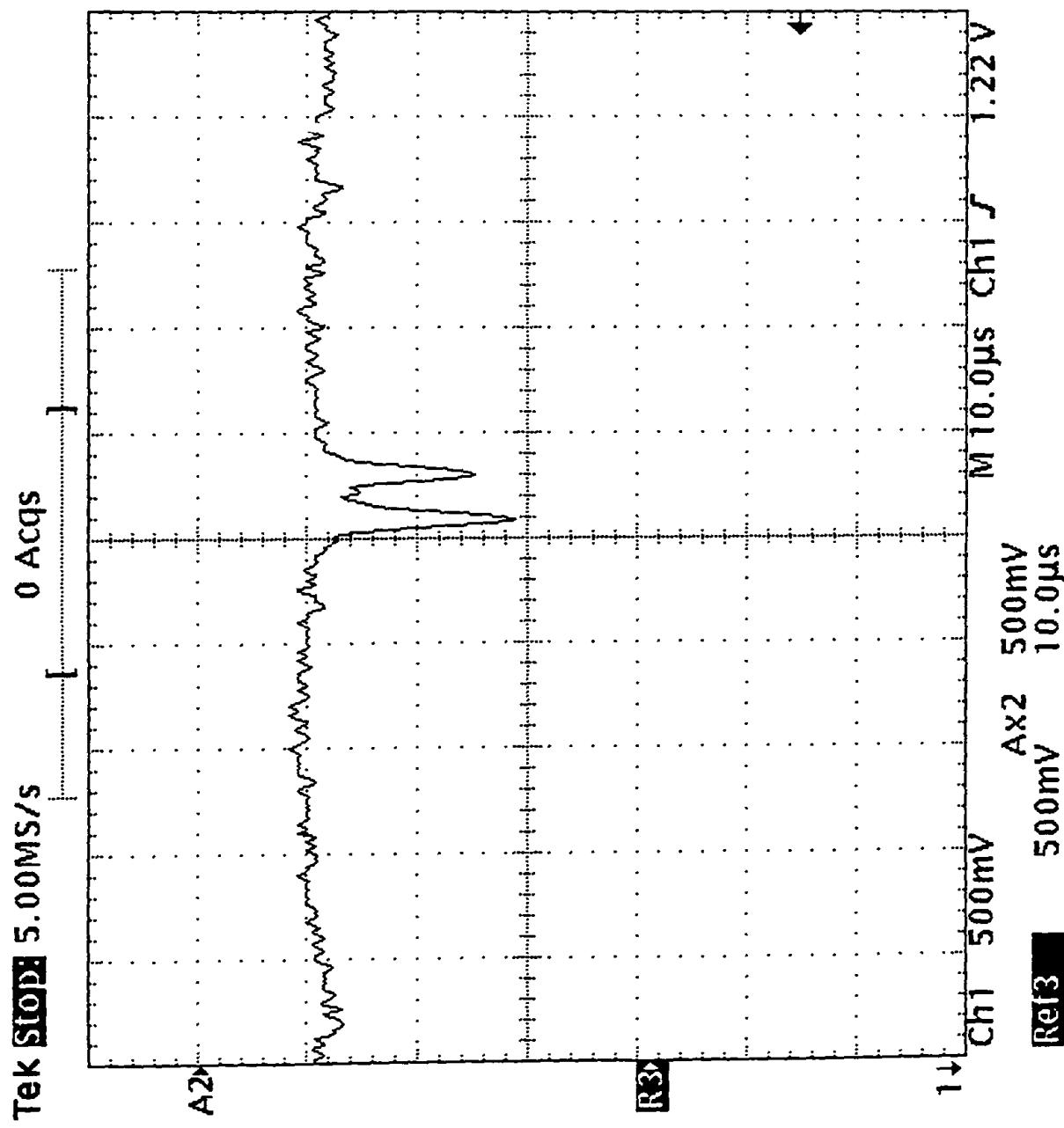


FIG. 15

10.0μs

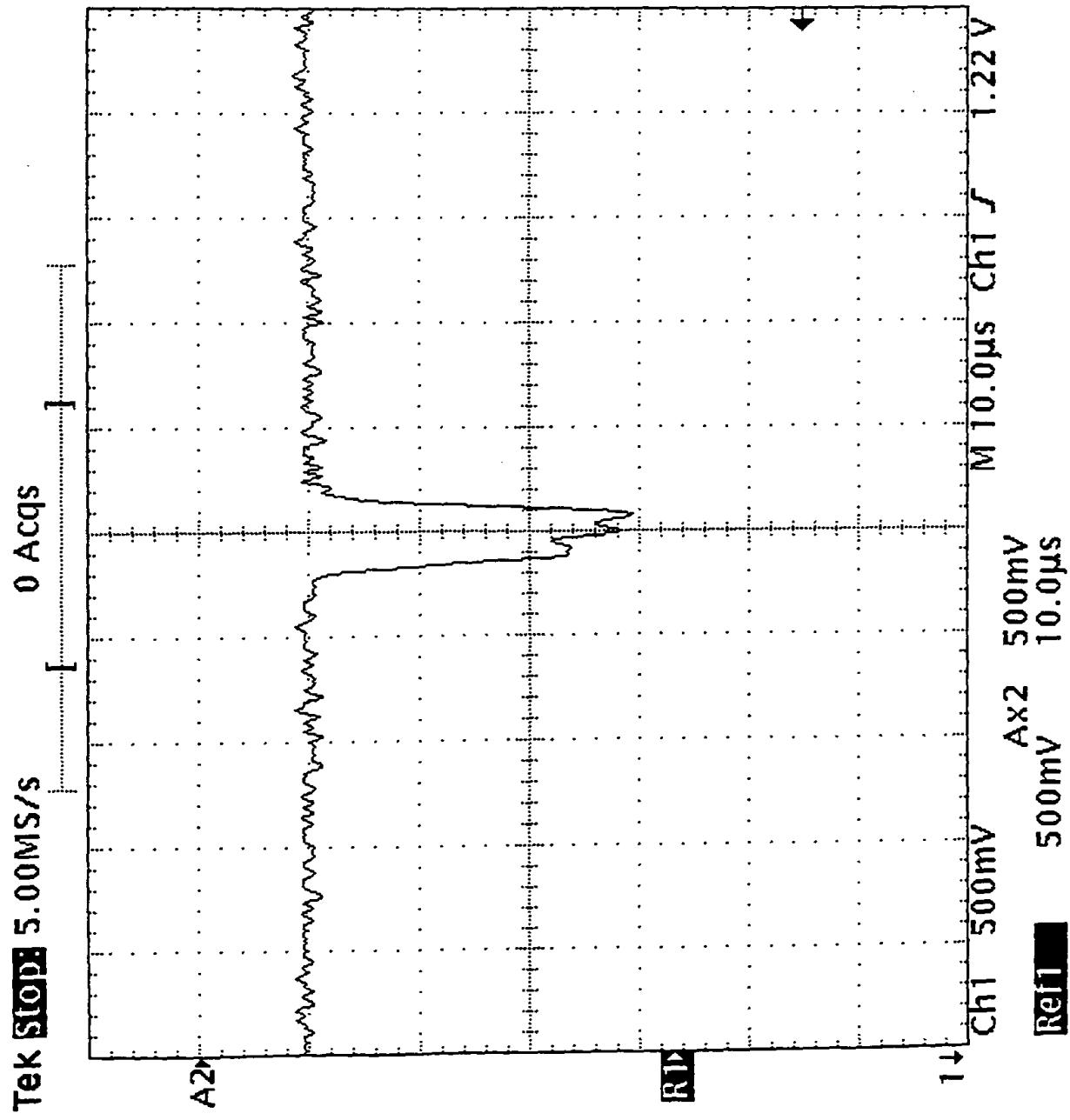


FIG. 16

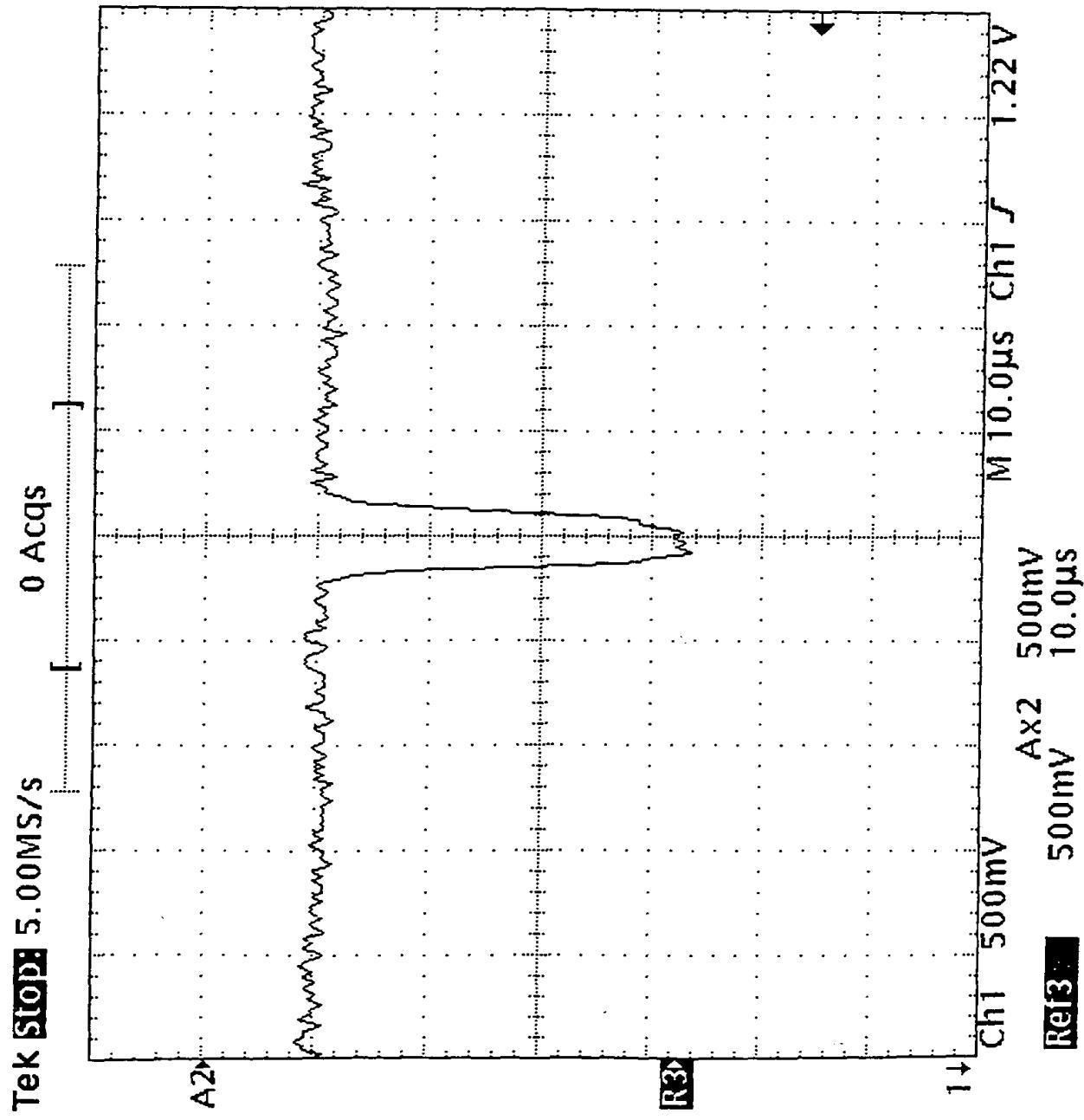


FIG. 17

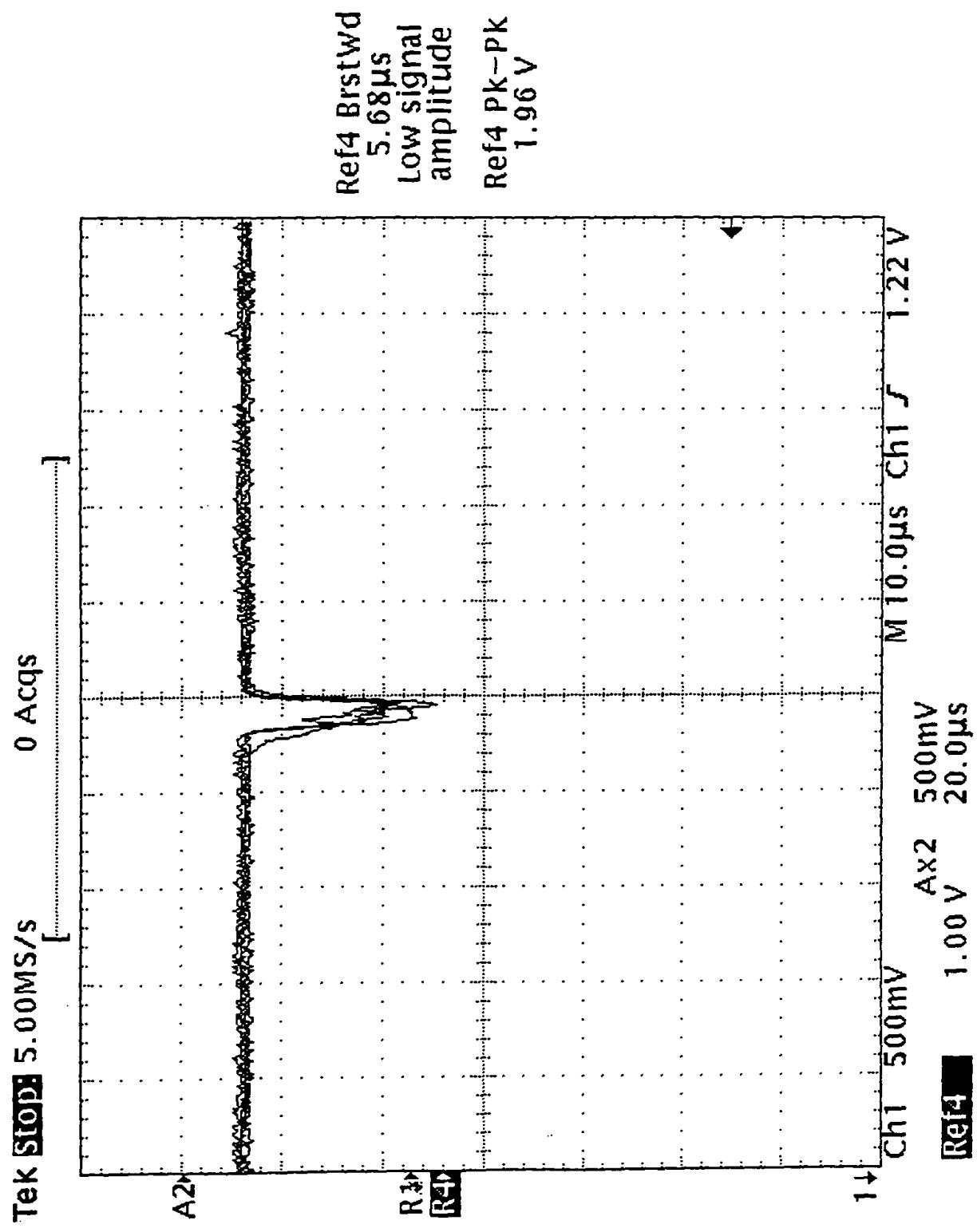
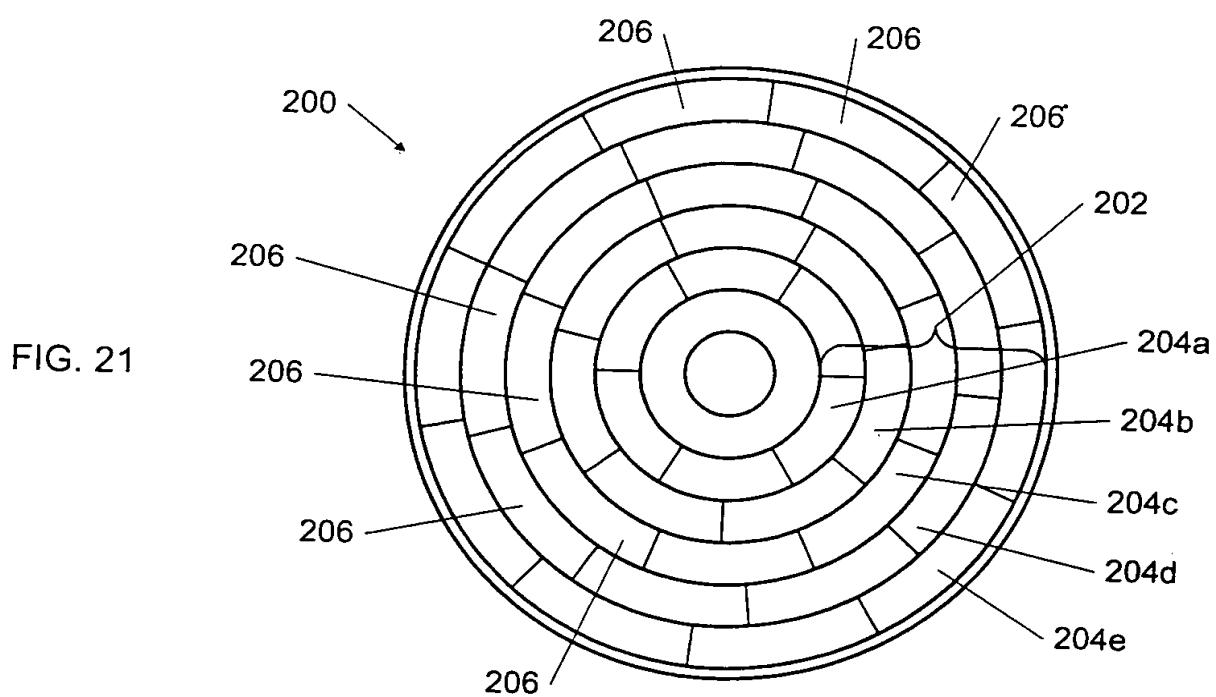
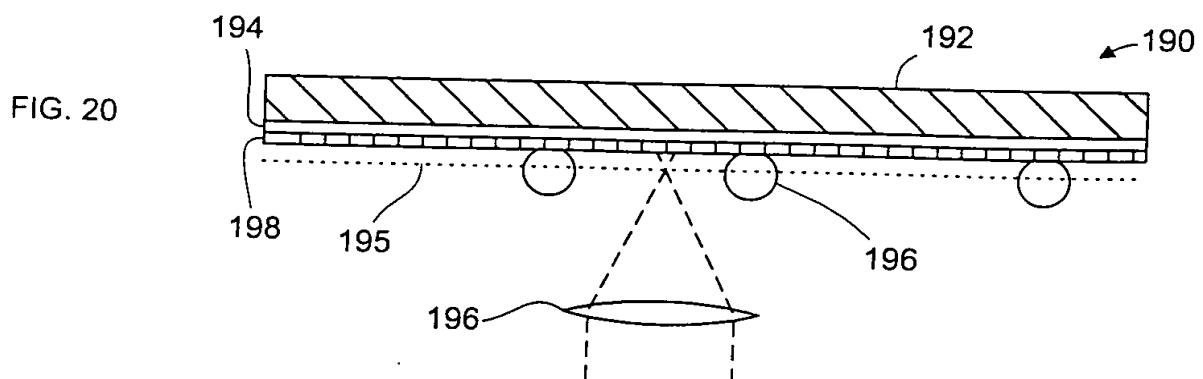
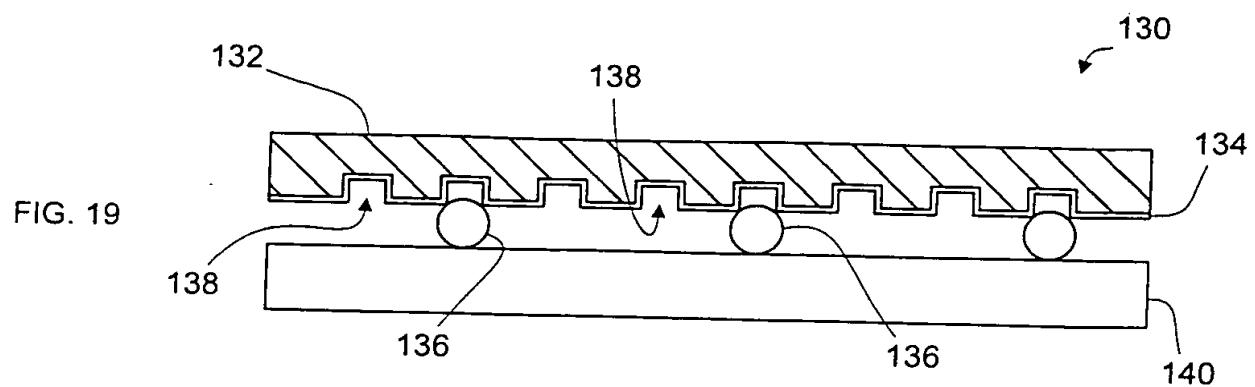


FIG. 18
 The effect of the noise on the signal



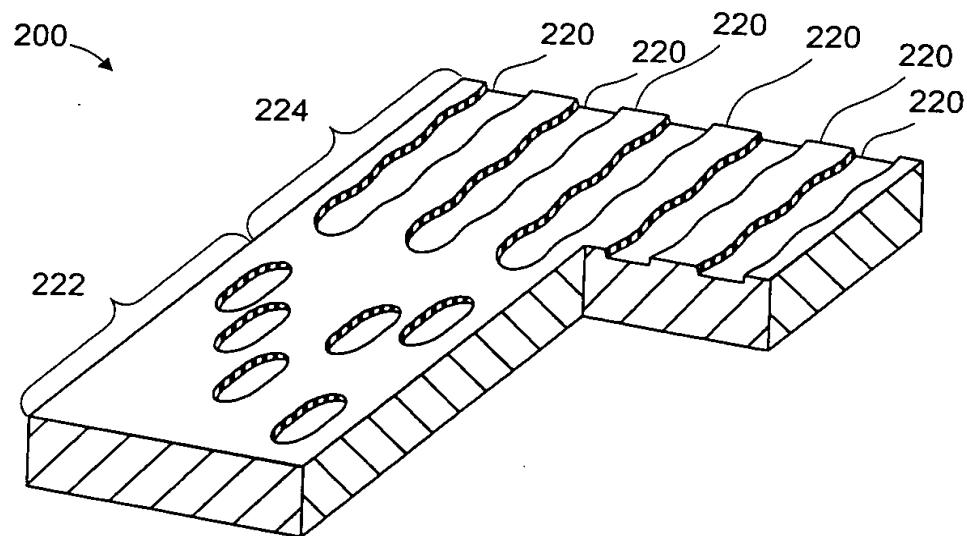


FIG. 22

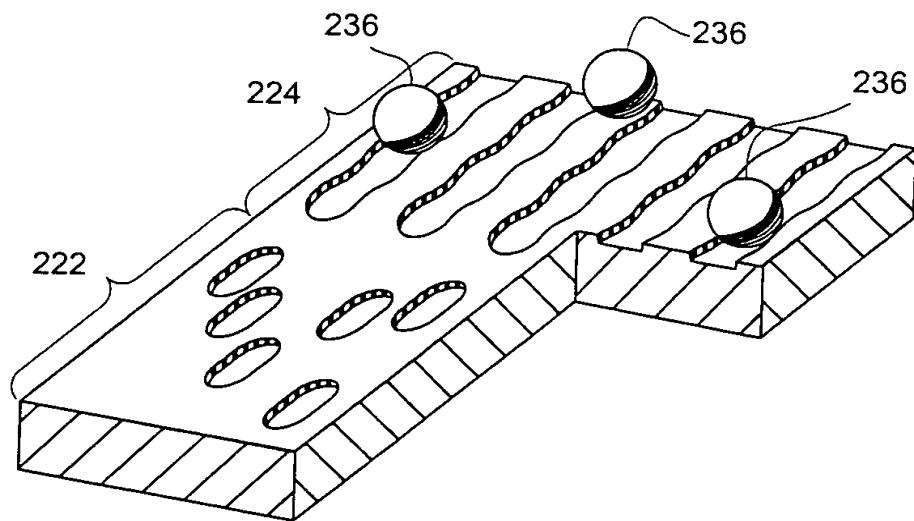


FIG. 23

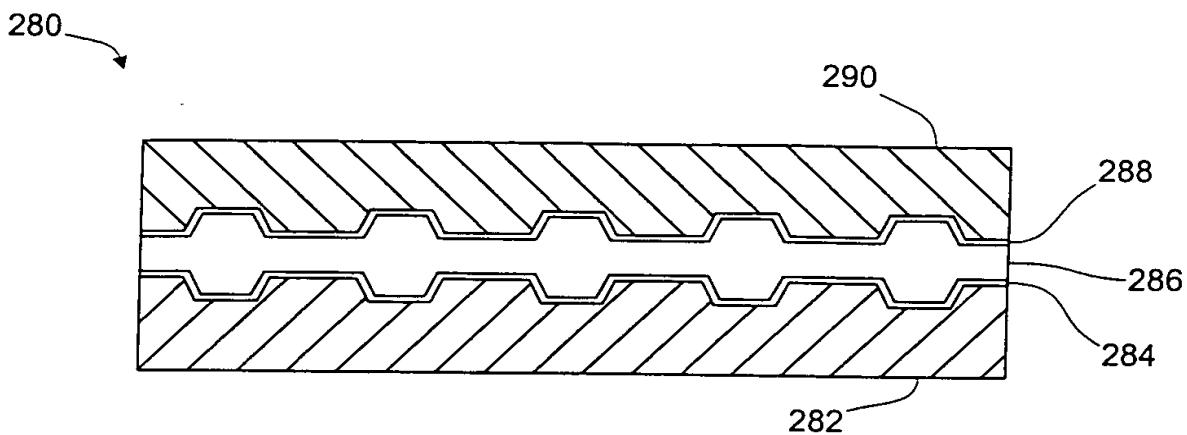


FIG. 24

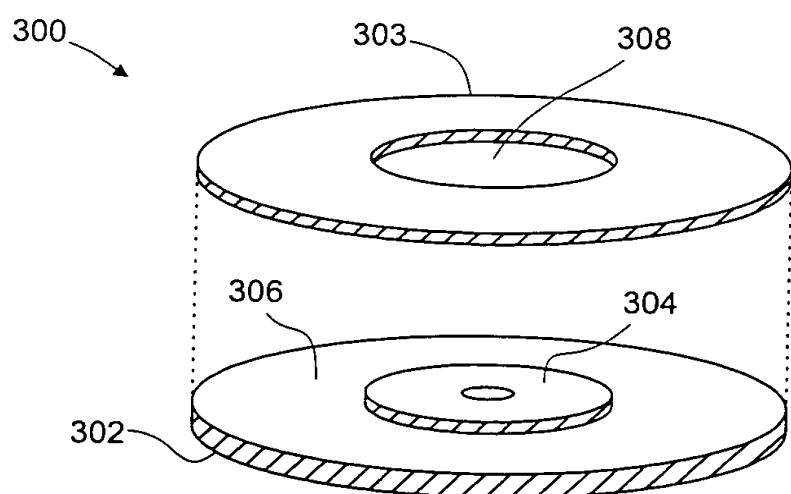


FIG. 25

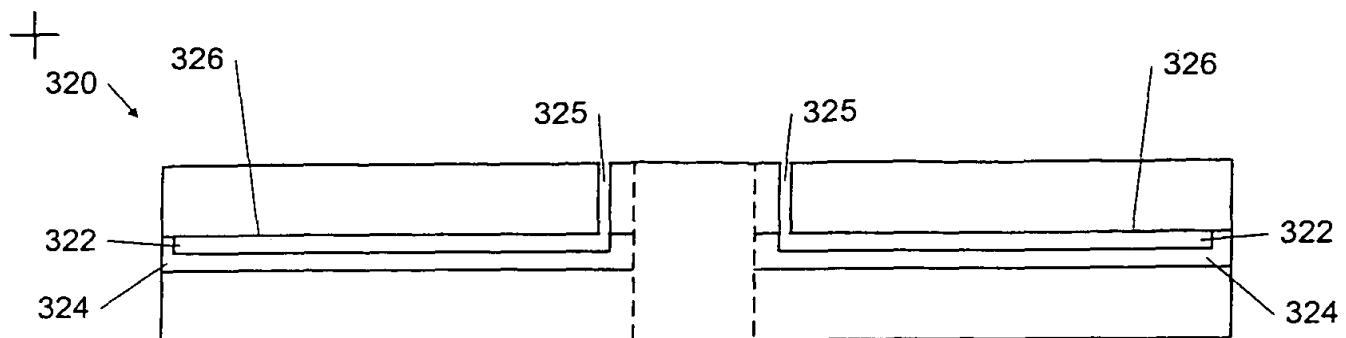


FIG. 26

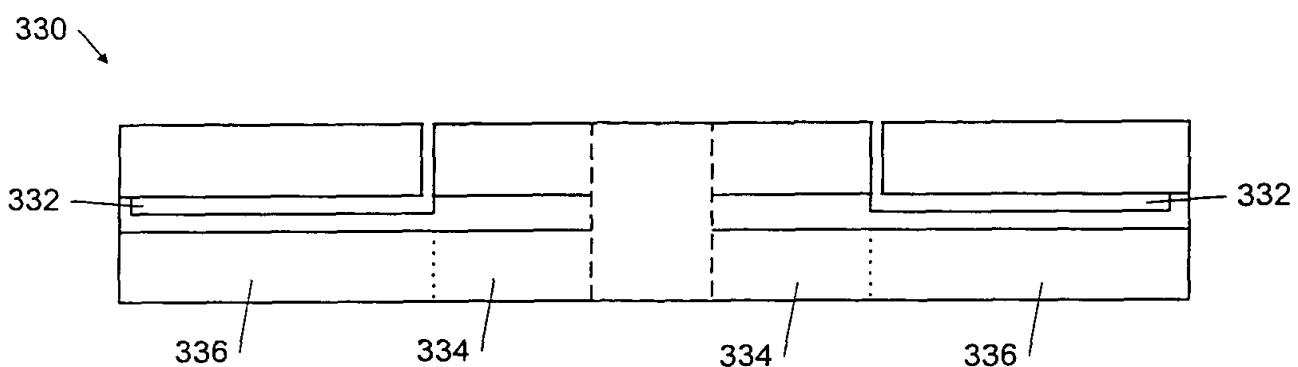


FIG. 27

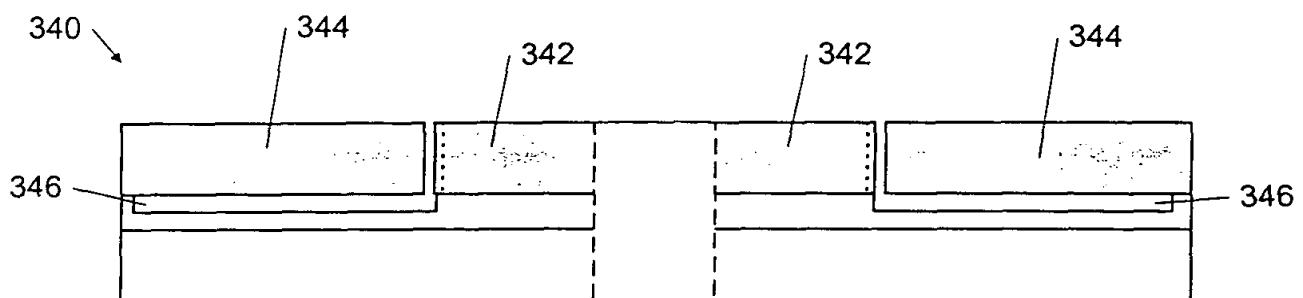


FIG. 28

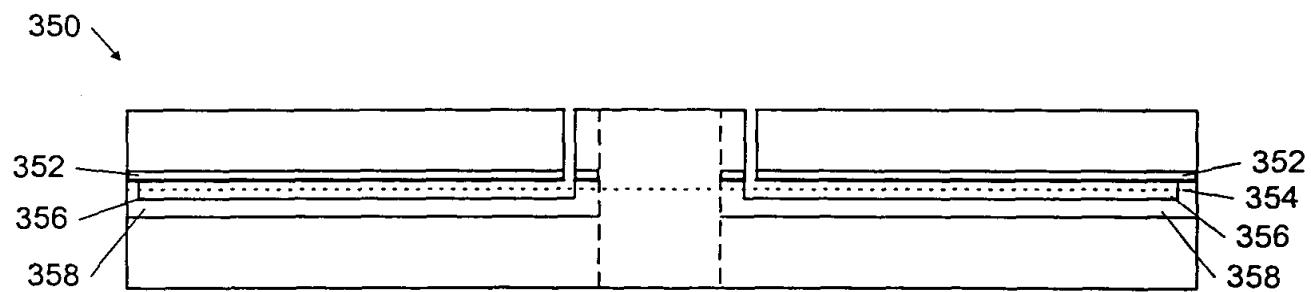


FIG. 29

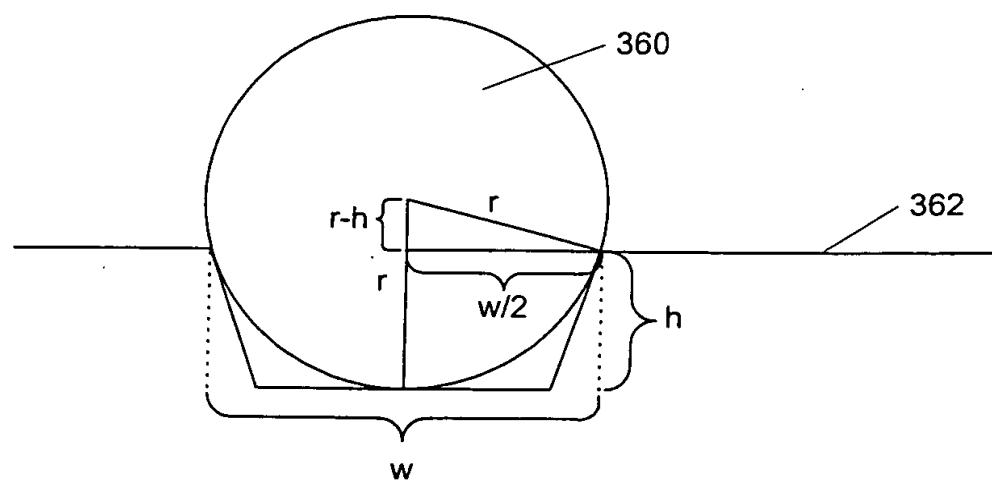
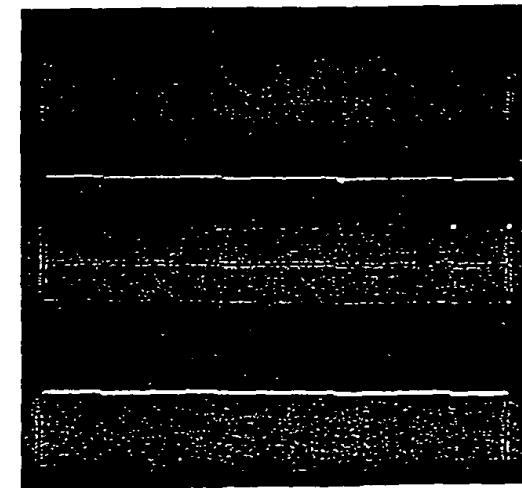
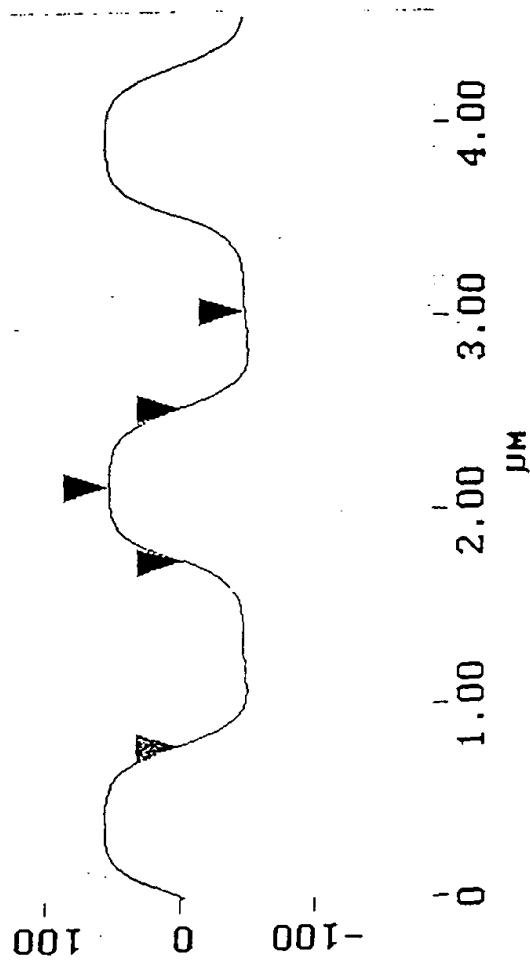
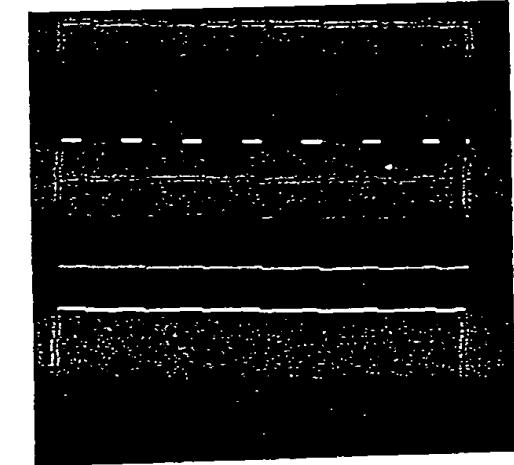
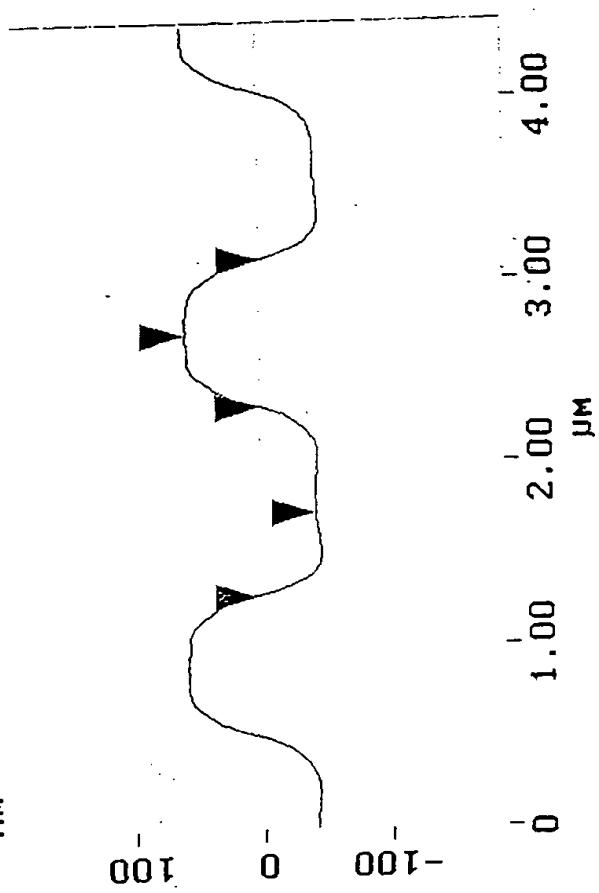


FIG. 30



Cursor: average Zoom: 2:1 Cen line: off offset: off

Section Analysis



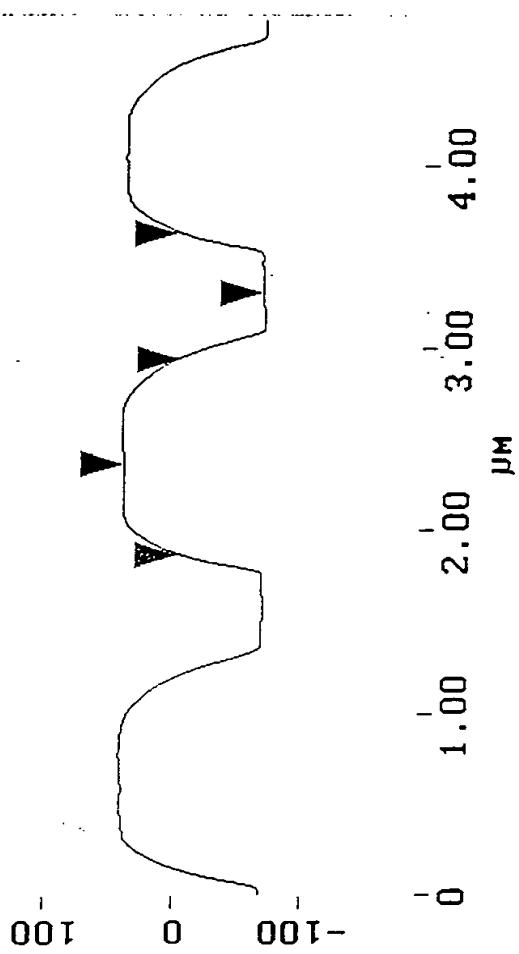
RM159000.000

Cursoor! **average Zoom:** 2:1

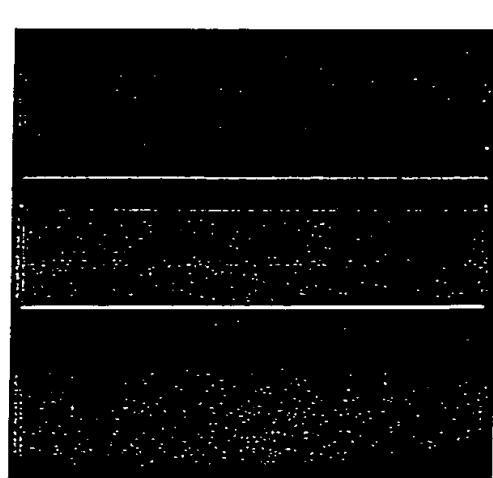
Cen line: off offset: off

FIG. 32

Section Analysis



Spectrum



Cursor: average Zoom: 2:1 Cen line: off offset: off

FIG. 33

SECTION ANALYSIS

L	683.59 nm
RMS	21.794 nm
1c	DC
Ra(1c)	16.951 nm
RMax	67.772 nm
Rz	66.682 nm
Rz Cnt 2	
Radius	820.71 nm
Sigma	8.514 nm

Surface distance	956.26 nm
Horiz distance(L)	937.50 nm
Vert distance	107.52 nm
Angle	6.543 deg
Surface distance	1.084 μm
Horiz distance	1.074 μm
Vert distance	4.127 nm
Angle	0.220 deg
Surface distance	715.65 nm
Horiz distance	683.59 nm
Vert distance	3.943 nm
Angle	0.330 deg
Spectral period	DC
Spectral freq	0 Hz
Spectral RMS amp	3.603 nm

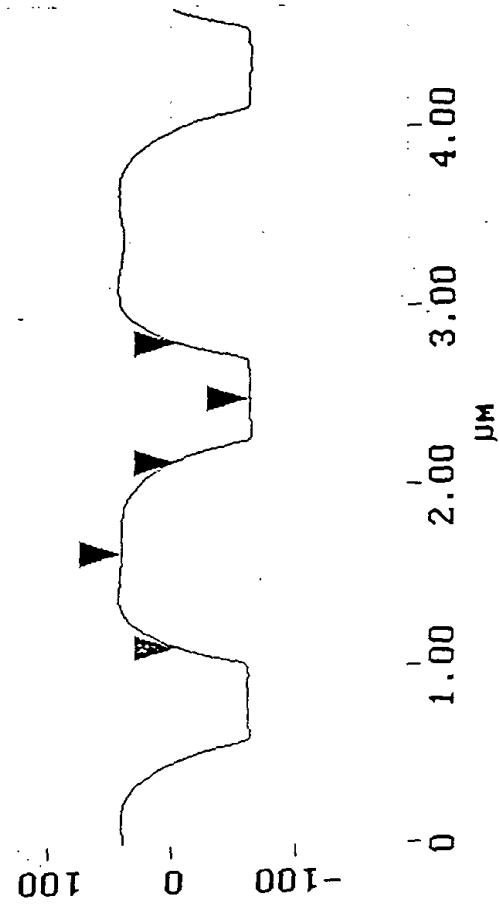
Cursor: average Zoom: 2:1 Cen line: off offset: off

FIG. 33

SECTION ANALYSIS

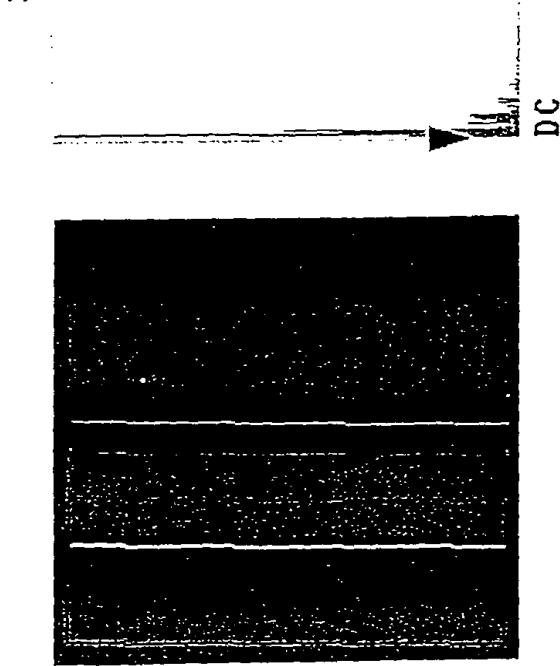
Section Analysis

nm



L	664.06 nm
RMS	20.135 nm
1c	DC
Ra(1c)	14.972 nm
RMax	66.116 nm
RZ	64.871 nm
RZ Cnt	2
Radius	824.44 nm
Sigma	8.988 nm

Surface distance	878.62 nm
Horiz distance(L)	859.38 nm
Vert distance	102.80 nm
Angle	6.821 deg
Surface distance	1.046 μm
Horiz distance	1.035 μm
Vert distance	4.540 nm
Angle	0.251 deg
Surface distance	695.52 nm
Horiz distance	664.06 nm
Vert distance	2.814 nm
Angle	0.243 deg
Spectral period	DC
Spectral freq	0 Hz
Spectral RMS amp	3.340 nm



Cursor: average Zoom: 2:1 Cen line: off offset: off

FIG. 34

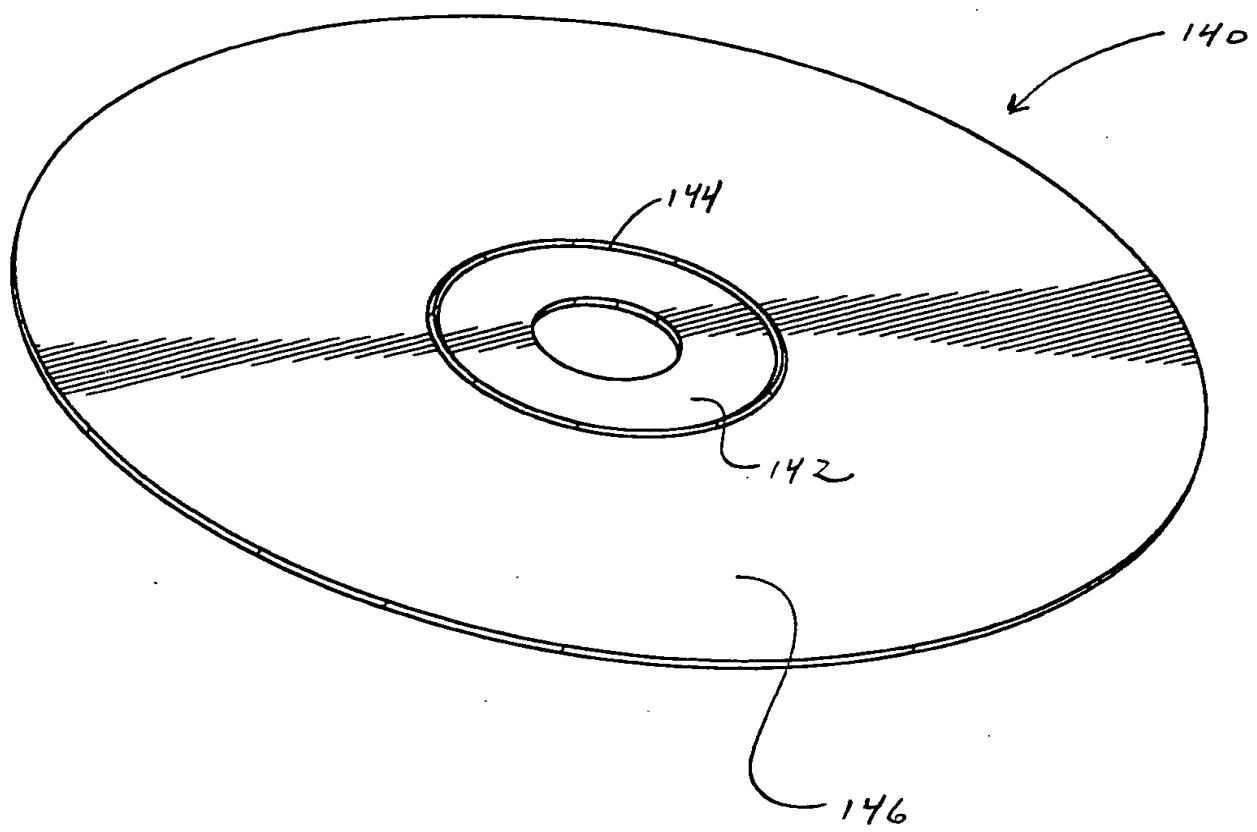


FIG. 35

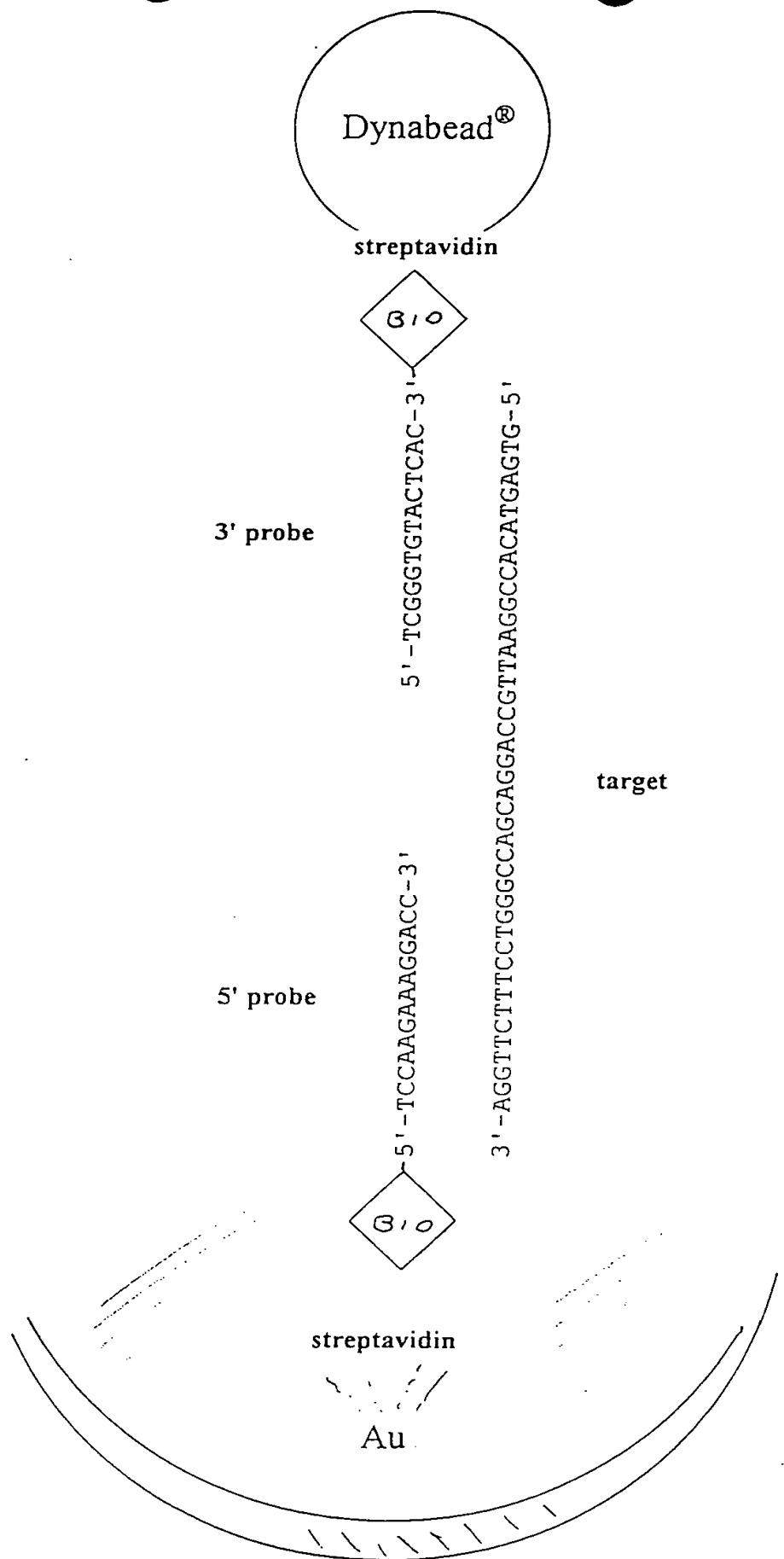
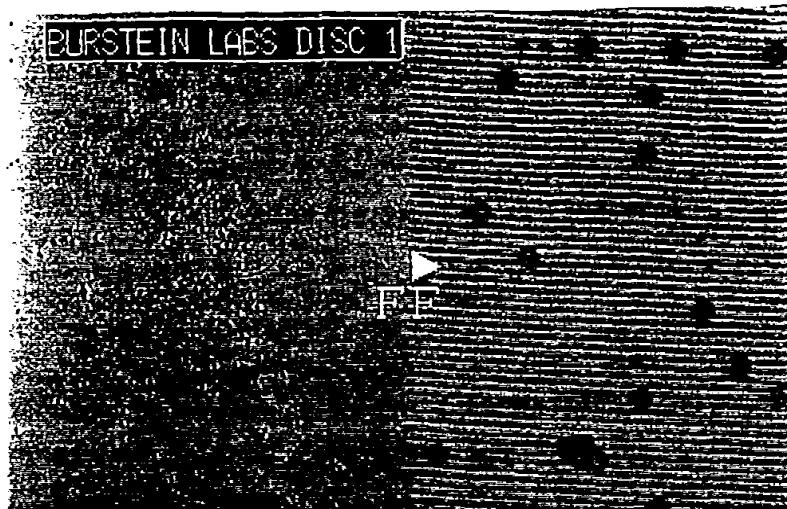


Fig. 36

BURSTEIN LABS DISC 1

A

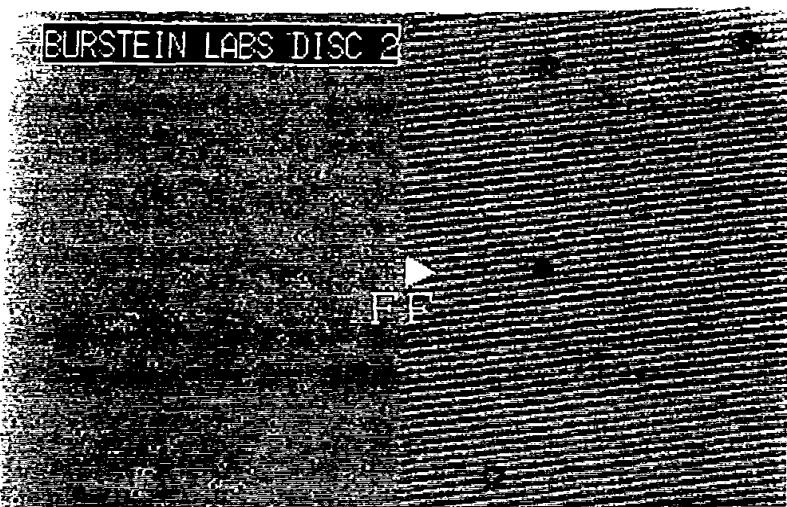
20 femtmoles



BURSTEIN LABS DISC 2

B

20 attomoles



BURSTEIN LABS DISC 3

C

20 zeptomoles

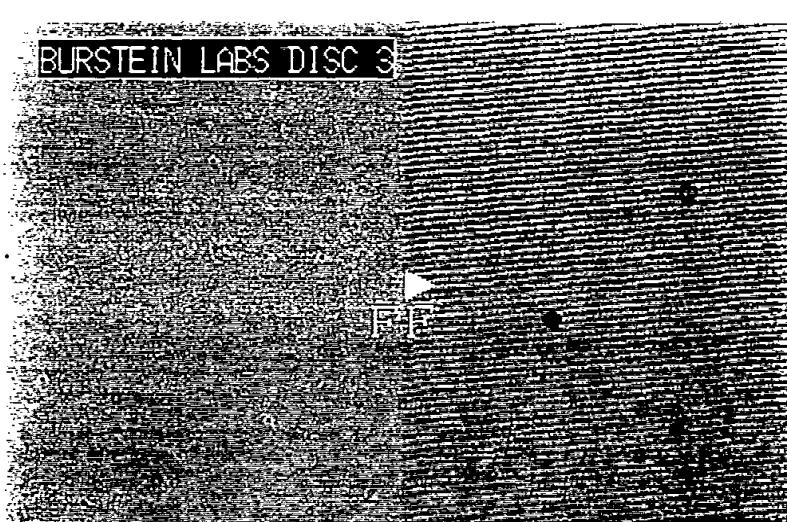


FIG. 37

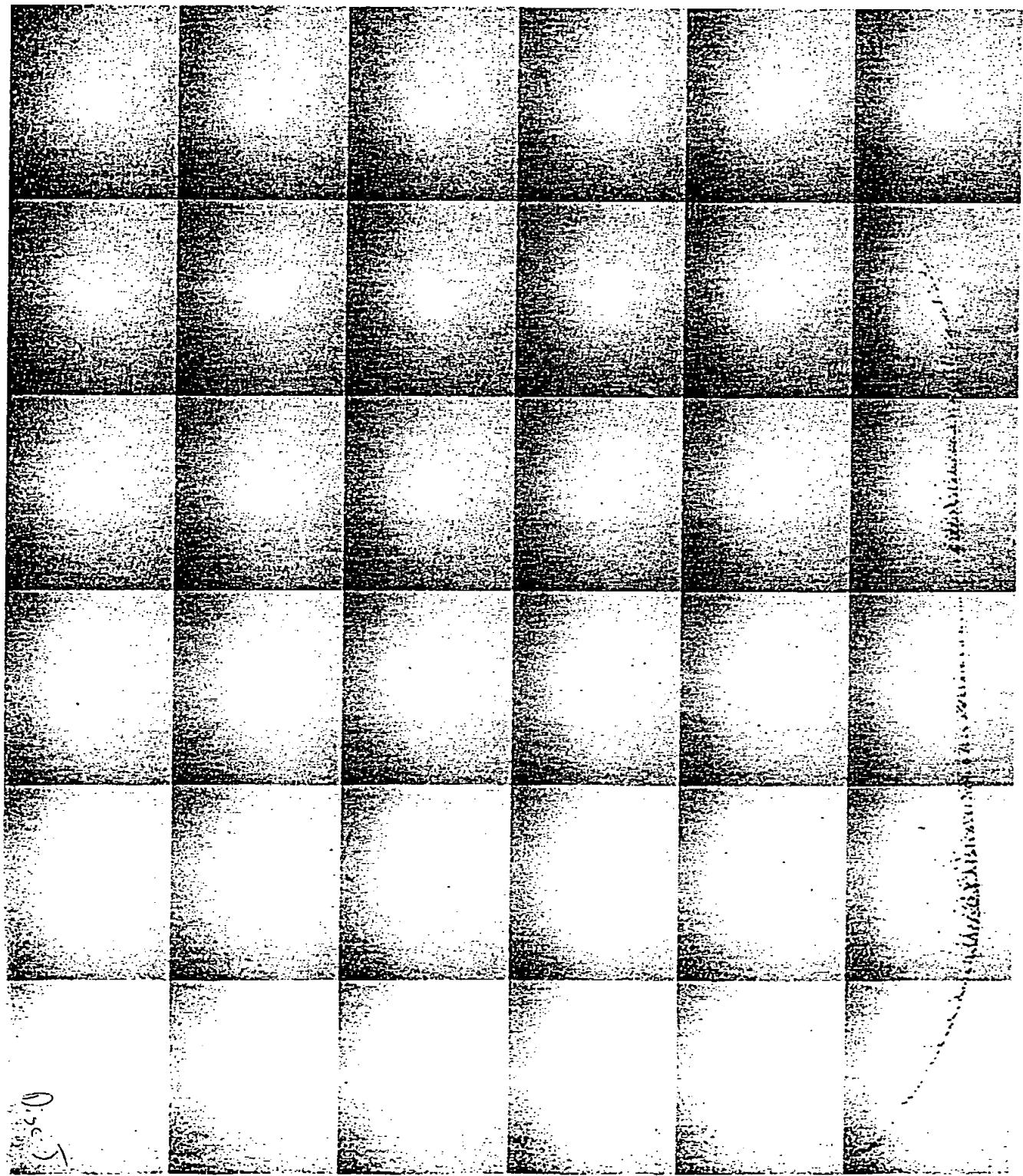


Fig. 38

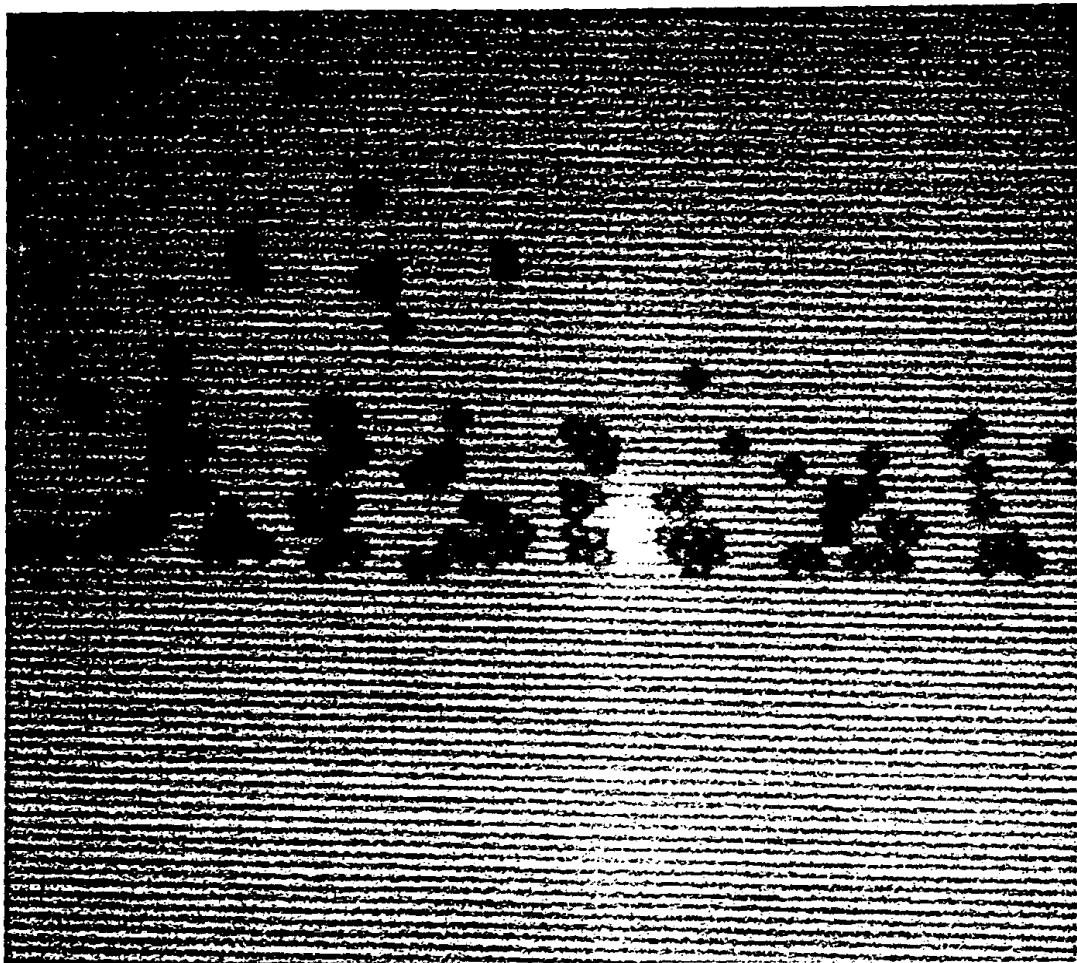


FIG. 39

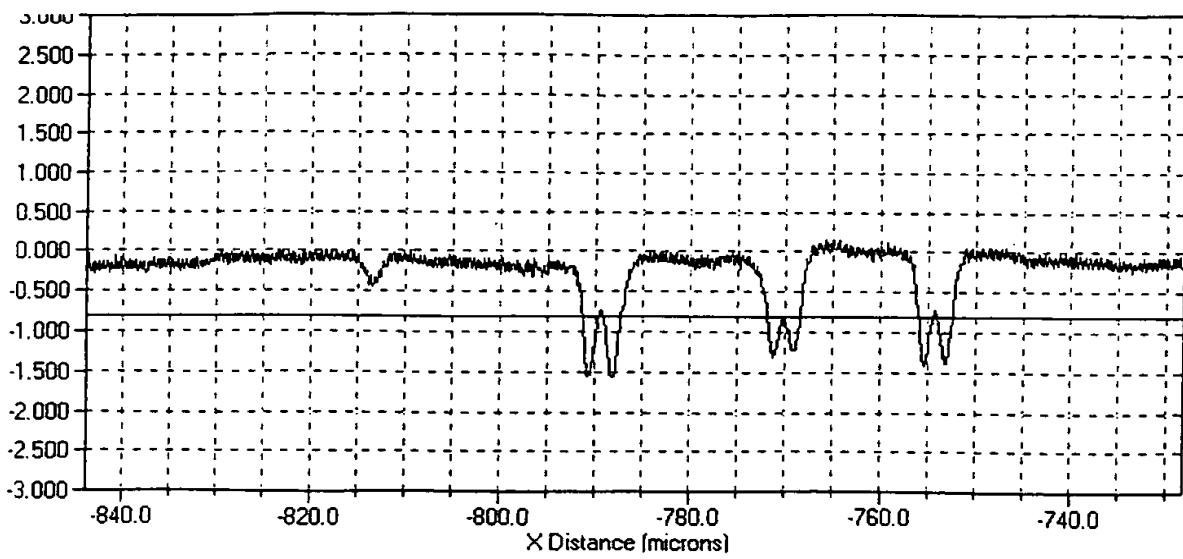


FIG. 40

Fig. 41A

Supplementary sheet, mold acceptance test				CD-3-AWM	
Job No.	36-10236	Agent	CR-R	Ram hold	vac + mech
SM Order No	9N.96293	Customer	Eximpo CS	Ram dia.	24
<i>Dimensions</i>					
0° = mold at top	R15	0°	90°	180°	270°
Thickness	R40	1.155	1.155	1.155	1.155
Center hole 15.05+/-0.03	15.05	Dm. 120+/-0.3 mm		Clouds	1/2
<i>Weight in g</i>					
Measure every 15 min.	Min.	0	15	30	45
during test	g	15.26	15.27	15.26	15.26
Max. diff. ± 0.1 g	g		15.26	15.26	15.26
<i>Water in mold</i>					
Sprue bush	ACTUAL	9 ltr./Mün.	7	Tol.	Scratches
Embosser		6 ltr./MIN.	7	-1/+3	Diesel effect
				-1/+3	Brown Discoloration
<i>Vacuum</i>		without	with	diff.	tol.
Handling	bar				
Ram	bar				
<i>Mold function</i>					
Embosser	✓	Raw material	Makrolon 2005	✓	<i>Molding compound cold</i>
Sprue ejector	✓		Lexan 1020		Thickness of cavity (3)
Ejector sleeve	✓		Panlite 5503		Venting gap (5)
Sprue bush	✓				Position of embosser (9)
<i>Air outlet</i>					Position of spare bush (10)
FS dia.	✓				Embossing stroke
BS dia.	✓				
					<i>Measuring means</i>
					Polarized light
					Halogen light
					Neon Light
					Black (UV Light)
					White paper
					Micrometer
					Balance

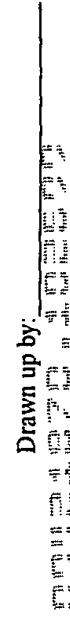
Drawn up by: 

Fig. 41B

Graph 1. Injection - Holding pressure

Cycle illustrated: 533957
Curve display: continuous

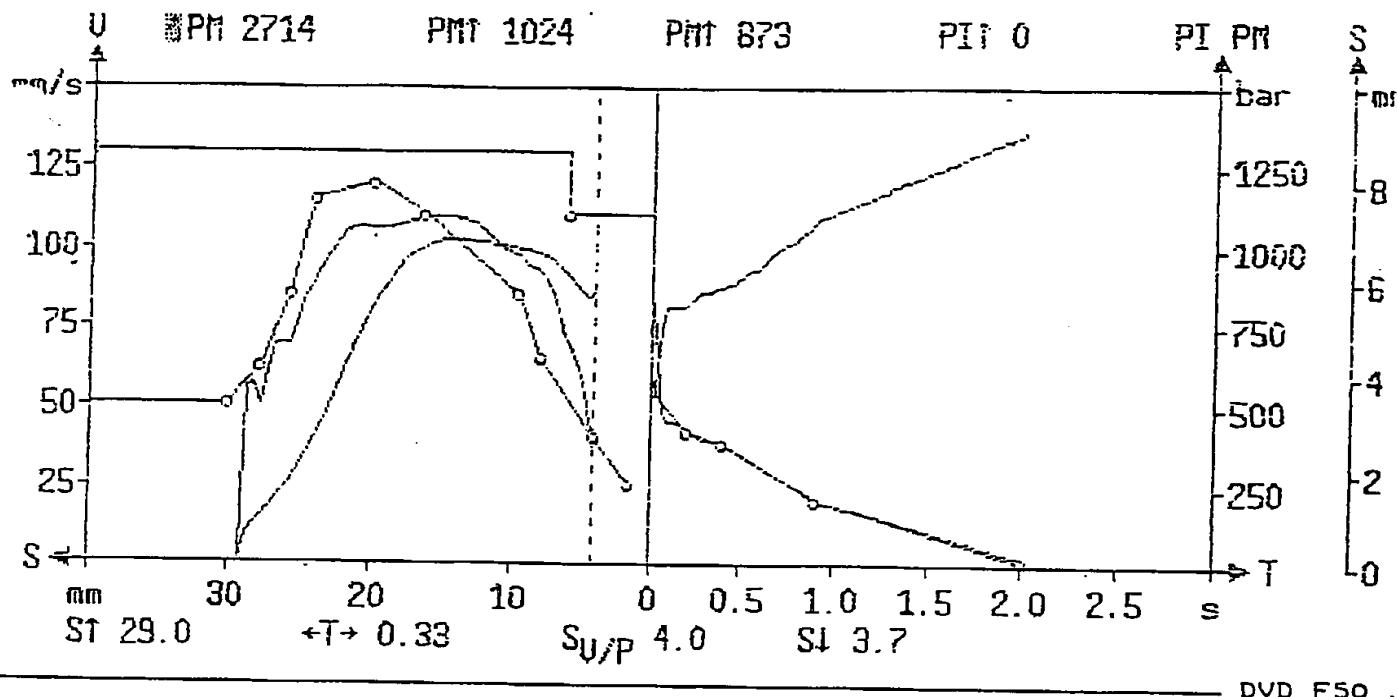


Fig. 41B

Fig. 41C

<u>01.01 Mold movement</u>		<u>02.01 Summary of mold auxiliary controls/robotics</u>	
Closing movement	V33 = 100% V34 = 100%	Closing time S33 = 019.0mm S34 = 000.7mm	T32 = 000.
Pressure initiation			
Opening movement	V41 = 100% V42 = 010%	Opening time S41 = 055.0mm	T36 = 000.
Braking			
Pause time	T40 = 000.000 s	Mold position S640 = 075.	
Mold closing pressures			
Closing pressure	P682 = 085%	T681 = 000.10 s	
Pressure build-up	p681 = 020%		
		Switched off	
	C608 = 0		
Enable removal	S680 = 0065.0		
Delays			
Blow off sprue	T602 = 000.03	Sprue blowing time T603 = 000.1	
Advance ejector pin	T53 = 000.10 s		
Transfer stroke forward	T55 = 000.12 s		
Transfer stroke return	T56 = 000.15 s	Extend removal T668 = 000.2	
Embosser forward	T62 = 001.20 s	Embosser return T63 = 000.1	
Blow on nozzle side	T75 = 000.50 s	Nozzle side blowing time T74 = 000.8	
Blow on moving side	T671 = 000.00	Moving side blowing time T71 = 000.1	
Unit forward	T680 = 000.70 s		
Starting program	C683 = 00000	T683 = 000.00 s	S683 = 0004.
Cycle time	T11 = 009.05 s		
Removal time	T640 = 000.70 s		

Fig. 41D:

03.01 Metering					
Screw retraction	C17 = 0			Switched off	
Metering Delay	T20 = 000.50 s			Metering time	T21 = 005.9
Metering stages	C124 = 2				
Metering end point	S23 = 026.0 mm	P23 = 00060 bar	N23 = 100 l.		
	S24 = 029.0 mm	P24 = 0010 bar	N24 = 020 l.		
Holding pressure	P27 = 0010 bar	Start of injection	SO = 029.0		
04.01 Injection					
Enable injection	\$682 = 0002.0 mm	Screw position	\$641 = 029.0		
Injection values	C121 = 10	Start of injection	SO = 029.0		
	V196 = 0050 mm/s	S196 = 030.0 mm			
	V197 = 0062 mm/s	S197 = 027.6 mm			
	V198 = 0085 mm/s	S198 = 025.6 mm			
	V199 = 0115 mm/s	S199 = 024.0 mm			
	V200 = 0120 mm/s	S200 = 019.8 mm			
	V201 = 0110 mm/s	S201 = 016.2 mm			
	V202 = 0085 mm/s	S202 = 009.5 mm			
	V203 = 0065 mm/s	S203 = 008.0 mm			
Enable V/P changeover	V204 = 0040 mm/s	S204 = 004.0 mm	T2 = 000.3		
Forcible changeover	V205 = 0025 mm/s	S205 = 001.5 mm	T11 = 004.0		
Flow number	S121 = 018.2 mm	S122 = 015.0 mm	C125 = 2776		
Pressure monitoring		Peak pressure	P125 = 01044		
First stage	P101 = 01300 bar	T201 = 00.02 s			
Second stage	P102 = 01100 bar	T201 = 00.02 s	S102 = 006.0		

Fig. 41E

04.02 Holding pressure, cooling

Holding pressure values	C122 = 04 P12 = 00550 bar	Changeover point	S11 = 004.0
	P117 = 00420 bar P118 = 00380 bar P119 = 00200 bar	T117 = 000.20 T118 = 000.40 T119 = 000.90 T120 = 002.00	
Holding pressure time			
Cooling time	T39 = 005.30 s		
Melt cushion monitoring			
Upper limit	S219 = 010.0 MM	Melt cushion Lower limit	S19 = 003.7 S119 = 000.5

05.01 Nozzles, unit, purging/dry cycles

Standstill monitoring	C606 = 60 min	C640 = 0004 min	
Unit forward	T680 = 000.70 s	V29 = 030 %	
Lift	T30 = 000.30 s	V30 = 050 %	
Unit set-up and manual movements			
Move forward	V816 = 030 %	Lift	V806 = 030 %
Purge/dry cycle/clean			
Number of metering strokes	C16 = 20	C201 = 50	
Metering	S16 = 028.0 mm	P16 = 0060 bar	N16 = 200
Injection	S18 = 001.5 mm	V101 = 05 mm/s	
Delay for purging	T606 = 000.00 s		

Fig. 41F

06.01 Temperature control, plastifier zones/temperature control devices

Zone/description	Set point	Actual value	Reduced	Tolerance	Heating outputs	Cooling
				minus	plus	
10 Melt temperature	310 •C	305 •C	180 •C	040 •C	040 •C	014%
30 Nozzle	330 •C	330 •C	180 •C	040 •C	040 •C	025%
13 Nozzle	315 •C	315 •C	180 •C	040 •C	040 •C	008%
Cylinder head	310 •C	310 •C	180 •C	040 •C	040 •C	005%
15 Compression	305 •C	305 •C	180 •C	040 •C	040 •C	006%
16 Compression	305 •C	308 •C	180 •C	040 •C	040 •C	070%
18 Feed	300 •C	295 •C	180 •C	040 •C	040 •C	024
20 Inlet	060 •C	060 •C	060 •C	040 •C	040 •C	

Zone/description	Set point	Actual value	Reduced	Tolerance	Heating outputs	Cooling
				minus	plus	
24 Heating/cooling device	112 •C	093 •C	050 •C	020 •C	020 •C	000%
25 Heating/cooling device	114 •C	091 •C	050 •C	040 •C	020 •C	000%

08.01 Disk transfer

Peripheral interface	C684	=	0	Without signal acknowledgement
Buffer switch-off size	C680	=	65000	
Production delay	T682	=	001.00 s	
Max. transfer time	T601	=	001.00 s	With interruption of cycle

Fig. 41G

09.01 Production control						
Application	C340	=	2	No application		
Data set number	C315	=	100			
Production sequence						
Item number	C303	=	1		Piece counter Cycle counter	C324 C325
Cycle time	T11	=	009.05 s	Failure rate	C718	= 29270
Production preparation				Reason	C357	= 30.56% 00
10.01 Process statistics						
Q monitoring	C340	=	2	Monitoring without screening out		
Q report	C700	=	0	No report		
Total	Cycles of which			out of tolerance		failure rate
Random sample	C325	=	29270	C318 = 8946	C718 = 30.56%	
	C326	=	29269	C338 = 8946	C738 = 30.56%	
Process variables						
	Set Point x		Tolerance +/-	Actual Value x	Mean xq	Scatter 3s
Metering time	1.20		0.30	5.98 s	2.32	5.408
Injection start	30.1		2.0	29.0 mm	28.6	-0.6786
Injection time	0.47		0.20	0.333s	0.39	0.82
V/P changeover point	3.5		1.0	4.0 mm	4.0	0.105
Melt cushion	4.2		1.0	3.7 mm	3.8	0.04
? peak value	600		200	871 bar	682	0.25
? peak value	0		0	0 bar	0	0
Flow number	2500		300	2776	2441	0.04
Cycle time	3.90		0.50	9.05 s	5.08	0.0
						0.359
						-0.6570

Fig. 41H

10.02 Configuration of the quality monitoring

Reaction: Process data outside tolerance
Switch-off behavior C703 = 0

no reaction

10.03 Q report intermediate store

DVD F.1

Job data

He had seen the man who had been with the woman in the room.

Fig. 41 I

16.01 System characteristics

Machine data	DISCJET 600/110 PAC 13.54 DB 05.80 350400	Order number IMC 12.26 Date created 23.10.1996 Version 17106	DVD_F50 CEL_10.31 23.10.1996 17106
Mold data			
Installed height	990	=	160.0 mm
Plasticizing			
Ram nominal diameter		Identification S801	024
Max. permissible melt pressure		= 032.0 mm	Max. metering stroke
Max. permissible backpressure		PB00 = 01482 bar	Max. specific melt pressure
		P801 = 0317 bar	P802 = 01482 bar
Temperatures			
Cabinet		Set point/actual value TH1 = 035 026 °C	Tolerance -/+ 030 °C
Oil		TH2 = 050 051 °C	041 °C
			010 °C
			011 °C
			000%
			005
			Heating
			Cooling